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The Effects of Earthquakes on Buildings.

DESTRUCTIVE earthquakes so seldom happen in this country that architects have not hitherto considered it a duty to specially study the construction of buildings with a view to minimise the effects of earthquake shocks. Architects nowadays, however, are frequently called upon to choose sites and to design and superintend the erection of buildings in various parts of the world, including earthquake countries; so that a few remarks concerning the phenomena and their effects may not be altogether valueless. It is a very large subject, and one full of interest, but we cannot do more at present than give a brief outline of the known facts, pointing out defects and the remedial measures which may be adopted.

Let us commence by explaining what an earthquake is from a scientific point of view. An earthquake is any natural subterranean concussion the effects of which are visibly manifested at or near the earth's surface by movements of different kinds. Certain earth movements are sometimes called earthquakes, which would not, strictly speaking, fall within this definition; and it is desirable to indicate these, inasmuch as they are of a different nature, and consequently have widely divergent effects on buildings. The movements lastly referred to are chiefly the result of subsidence of large tracts of the earth's crust, owing apparently to the falling-in of gigantic subterranean caverns, which caverns have been hewn out of the rock by natural causes, such as the action of running water, sometimes heated and containing acids; or the abstraction of soluble mineral matter by the same powerful agent. Examples of this class of movement on a small scale are furnished by the subsidence of land in Cheshire and other places, owing to the abstraction of salt by both natural and artificial means, and by coal-mining. Such movements generally originate at a very short depth from the surface of the ground, and are not widespread in their effects; whilst the movements communicated to buildings situated within the disturbed area are of a totally different nature to those in a district caused by an earthquake, properly so called. The same remarks apply to any movements of the ground due to landslips,—the slipping or displacement of enormous tracts of clay or rock.

The exact causes of a real earthquake are at present unknown; many hypotheses have been put forward to explain the phenomena, but it does not fall within our province to refer to these. Suffice it to say that, so far as the effects enable us to judge, enormous concussions or explosions take place at a comparatively shallow depth,—a few miles only,—within the earth's crust, producing wave-like undulations, which are transmitted by the rocks around to the surface of the ground. It seems quite clear that there is a definite place of origin in each earthquake, and this is called the seismic centre, and there is no doubt that the undulations referred to, are concentrically disposed with reference to this central point. They may, in fact, be likened to the waves produced in still water agitated by a stone thrown into it. From this it will be seen that buildings situated immediately over the seismic centre are not liable to be injured so much as those at a short distance, for in the one case the movement is more or less vertical, and in the other it is approximately horizontal. Buildings are not usually, of course, constructed to withstand horizontal, or but slightly inclined, stresses of the nature produced by this movement, and herein consists the essence of our enquiry.

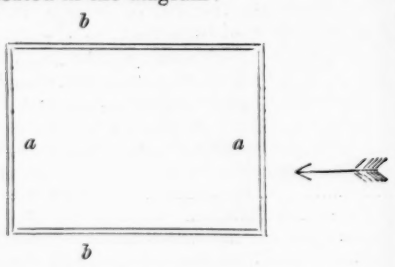
As a general rule, earthquakes commence as slight undulatory movements, which become more and more intensified until the great shock (or shocks) occurs, and then they gradually die away. The movements throughout, however, are exceedingly rapid, as will be seen further on. The ground is suddenly shaken several times under the buildings, the higher portions of which are thus made to vibrate the most, and have the greatest tendency to become prostrated. The natural outcome of this is, firstly, that buildings in countries often visited by earthquakes should not be tall; and secondly, that no heavy materials should be placed on the roofs, or in the higher portions of the structures.

Further, if, on visiting a district recently devastated by an earthquake, we carefully examined the directions of the cracks in the buildings, and the positions of the masses of fallen portions of structures, we should soon recognise some law governing the fractures and dislocations. Cracks would be prevalent in certain directions; angular portions of buildings in certain situations would be broken off, and much of the *débris* precipitated in similar directions; whilst walls placed in other positions would be untouched. All this tends to show that the motion produced by the earthquake was definite in direction. It is clear, therefore, that the destruction produced by earthquakes is not so irregular as at first sight might seem to be the case. But information of this kind, gleaned from observation on a single earthquake, is valueless from a practical point of view. When, however, we find that successive strong earthquakes in the same district, almost without exception, produce similar results on buildings similarly situated, we are led to conclude that there is a prevalent direction in the larger number of disturbances occurring in that district; and, knowing this direction, we can construct the buildings to resist the stress which will be produced by them. Mallet long ago recognised this fact, and his work on the Neapolitan earthquake of 1857 goes into the matter with considerable detail. The earlier seismologists, however, had not the advantage of the delicate instruments possessed by accurate observers nowadays, and the results arrived at by them, have necessarily undergone certain modifications.

It has remained for Professor John Milne, of Tokio, and his able colleagues and Japanese assistants, the members of the now celebrated Seismological Society of Japan, to work out the details of earthquake movement and its effects, and, what is more to our present point, to discuss the nature of the strains caused, and the construction of buildings intended to be earthquake-proof. In Japan at least two earthquakes happen every day, and observers in that country are, therefore, most favourably situated for studying the subject. Referring to the cracks produced in buildings by an ordinary earthquake, Professor Milne says* that when a building is subjected to a slight movement, the walls at right angles to the direction of the shock are rarely fractured, and this is assumed to result from the circumstance that walls in this position move backwards and forwards as a whole. The walls which are parallel to the direction of the movement are those which generally give way. Seeing that the motion is progressive and wave-like, this result might reasonably be expected, for walls in the latter position unquestionably are extended and contracted along their length, portions of the same wall being subjected to different

* "Earthquakes" (Internat. Scientific Ser.), 1886, p. 98.

phases of the wave during its passage, as indicated in the diagram:



The arrow indicates the direction of the movement. *a*. Walls at right angles to it, rarely fractured. *b*. Walls parallel to it, most liable to be fractured.

Professor Milne also gives an instance of what came under his observation on examining a number of houses of similar design and construction after the destructive shock in Tokio in 1879. These houses were in two stories, built of brick, and in many cases faced with a thin coat of white plaster. At the first-floor level there was a balcony, fronted by a low balustrade, supported by beams resting on columns, the roofs being made of thick tiles. The arches of the windows in the upper story were segmental, with heavy key-stones. The lower openings had a span of 9 ft., crowned with elliptical arches. In the 330 houses examined it was found that in the upper windows nearly all the cracks ran from the angle of arch and jamb at the springing-line. In the lower arches not a single crack was observed at the springing. "The cracks in these arches were near the crown, where beams projected to carry the balcony." The houses mostly cracked "were in the streets running parallel to the direction in which the greater number and most powerful set of shocks cross the city." From what we have said it will be seen that this result could be predicted; whilst we see the importance of constructing arches struck from a centre at the level of the springing-line,—*e.g.*, semi-circular or elliptical.

There can be no question that large windows and openings are great weaknesses; yet if they are specially constructed, they can be so arranged with reference to each other as to make them strong enough to resist a series of moderate horizontal pulls. A "flat arch" appears to offer more resistance to horizontal pulls than a true arch, though this must really depend almost entirely on the cohesive strength of the mortar or cement. A wooden lintel or iron girder would, of course, offer still better resistance to such a strain. It may be observed, as a general rule, that the last house in a row suffers the most.

As a matter of experience, Mallet points out that if an earthquake shock strikes a building diagonally, the general effect is to throw off almost the whole of the opposite vertical angle of the building in a triangular form, the base of the triangle being situated in the upper portion of the edifice, where the vibration is naturally greater, and the destruction more complete, than at the ground-line. As an example of this he instances the cathedral at Paterno, near Rome, which was thus affected by the Neapolitan earthquake of 1857.

After detailing a number of experiments on the walls of the Engineering College, Tokio, to determine whether the walls of an edifice which have once been cracked still continue to give way under similar shocks to those which produced them, Prof. Milne leads one to perceive that the presence of cracks in a building is a kind of preventive against its future destruction, in the event of a moderate earthquake: and he even speculates as to the desirability of designing buildings with joints and fissures in proper directions with a view to minimise the effects of shocks!

From the fact that the materials composing a building are of so many different kinds, they vibrate at different rates, the result being that where extremes meet, the destruction is most complete. Take, for example, a structure composed mainly of wood, with a brick chimney: a shock is communicated to the foundations, and the movement is much more rapidly taken up by the light wooden framework than the heavy brick chimney, which has a slower period of vibration. The effect is, that the chimney is cut off short at the roof. Such is the suddenness of a shock, that a buttress may not have time to transmit its stability to a wall, owing to these two portions of the edifice not vibrating simultaneously. Phenomena of this kind have been observed in nearly all earthquakes, and clearly demonstrate the advisability of making earthquake-proof buildings as compact as possible, and with materials having the same approximate and relative periods of vibration. The selection of suitable materials should, therefore, be a primary consideration.

Long experience has taught the Japanese and the natives of other earthquake-stricken countries the nature of the buildings required for their habitation. Up to within the last few years Japanese houses were mostly of the lightest construction, and were so elastic as to be seldom injured. But they have a greater enemy to fear than the direct effect of the earthquake itself,—namely, the fires which so frequently ensue, due to the shaking over of the stoves or pots on to the highly inflammable wooden structures, and from other causes. For centuries past the Japanese chronicles recording earthquakes show that it is the fires which are dreaded, and not so much the earthquake itself,—a fact more clearly appreciated when we read that in Tokio alone it is not uncommon to see, in the winter, 100 to 500 houses swept away at one time from this cause, and Professor Milne states that in one winter he saw three fires which altogether destroyed upwards of 30,000 houses. These circumstances are rarely taken into account, but they serve to show us why so many Japanese are having houses built on the European model. One great factor in construction now is strength, not elasticity alone; and, provided the buildings are properly designed, suitable materials used, and their positions studied with reference to the prevalent direction of earth movements in the district, the edifices should be able to withstand almost any kind of shock without being materially damaged. The proof of this is that the buildings in Tokio, strongly put together, which have been especially designed to resist earthquakes, have suffered either not at all or but very little, whilst those made after the usual European model have mostly come to grief.

There can be no question, however, that where funds are plentiful, and a building on a large scale is to be erected, the Japanese can build structures on their own plan which are eminently suited to withstand these earth-movements. None of the ancient temples appear to have suffered even at the worst periods. They are mostly built of innumerable pieces of timber, intricately fitted together, but leaving the whole building elastic. To retard the transmission of the momentum from the ground to their houses, they sometimes place these latter on round stones or rollers. The inhabitants of Guayaquil build their houses and churches of bamboo, tied together with cords, with the same object. Referring to the city of Caraccas, we find that many edifices have projecting basements with battering walls, which are better suited to withstand shocks than walls entirely perpendicular. Corner stones and roof-beams are frequently mortised. Mr. Warner states* that "In many streets broad iron girders riveted to the wall about a foot above the house door, run from house to house along the front of an entire square. Turret-like brick chimneys, with iron top ornaments, would expose the architect to the vengeance of an excited mob. The roofs are flat or flat-terraced; the chimney-flues terminate near the eaves in a perforated lid."

Earthquakes, although extending over large tracts of country, are very local in effect. Houses only a few hundred yards away from each other, apart from their methods of design and construction, are frequently affected in widely different manners,—*e.g.*, the inhabitants in one may experience but a slight shock, whilst those tenanting the other may feel the same shock much more intensified. The general direction of the movement is identical in both instances, but the geological structure and the contour of the ground may most profoundly modify the effects of the shock. It is a well-known fact that no matter how much a country as a whole, may suffer from earthquakes, there are certain spots within it which can be more or less definitely ascertained to be quite free from these disastrous phenomena, and, as our knowledge concerning seismology increases, maps of earthquake countries will be constructed, showing the comparative frequency and intensity of these earth-movements at all places. Indeed, this could be done in a rough way at the present time for certain parts of Japan; and in many other countries secure places can be pointed out. But perhaps the most practical method of dealing with this part of the subject at the present time is to discuss a few points concerning sites, which can with certainty be predicted as being specially dangerous in almost any affected locality. To assist in explaining these we will now give some further particulars of the action of earthquakes from a geological point of view.

The velocity of the earth-wave varies throughout different parts of its course, according to the nature of the materials through which it passes. Mr. Mallet has calculated that the shock produced by an explosion of gunpowder, in an experiment carried out at Holyhead, travelled at the rate per second of 951 ft. in wet sand, 1,283 ft. in friable granite, and 1,640 ft. in solid granite. In the Calabrian earthquake of 1857 he found that the shock varied from 658 ft. to 989 ft. per second in different parts of its course. That of Lisbon in 1761 varied from 2,576 ft. to 4,122 ft. per second, and the great Tokio, in 1881, gave a result, recorded by accurate seismographs, of 4,300 ft. per second. When an earthquake wave passes from one formation into another made of different materials and having a different degree of elasticity, a portion of the motion is arrested, and is reflected to the surface bounding the two formations, the remainder, of course, being refracted. The shock along such boundary lines is, therefore, much greater than would otherwise be the case. From this we see the advisability of not erecting buildings too near the line of junction between a hard rock and a soft one,—such as a bed of sand or clay of medium thickness. The Suffolk and Essex earthquake of April 22, 1884, may be cited (from amongst many others) as a case in point.

A house in an earthquake country should never be built anywhere near the edge of a cliff or ravine. The shock is transmitted from particle to particle through the rocks, and the unsupported portion adjacent to the edge of the ravine is either thrown or split off, or is much more violently shaken than is the case in situations where the site is, as it were, buttressed on either side by plenty of solid ground.

Even in so slight a shock as the English earthquake of 1884, before alluded to, the truth of this law was most painfully enunciated, as is pointed out by Professor Meldola. On the other hand, the presence of comparatively small cuttings, and especially where they are very numerous, is a protection against these earth-movements, for they break the blows, so to speak. The occurrence of large catacombs, many wells, &c., have had a great deal to do in preserving certain Roman cities. If in the grounds of a mansion a tolerably large, deep, and long sheet of ornamental water were made on the side of the building facing the quarter whence the prevalent earth-movements come, it would materially assist in preserving the edifice from destruction.

And now as to the kind of ground to build on. We have seen that the elastic wave passes more rapidly through solid rock than it does through less coherent materials. The

* H. D. Warner, "The City of Earthquakes." *Atlantic Monthly*. March, 1883.

question is whether it is preferable to build on solid rock or not? One would imagine at first sight that it would not be desirable to build on a material which propagates motion so rapidly and with such force as solid rock; yet experience has, with one or two isolated exceptions, proved the contrary. Thus, in the great Lisbon earthquake, the buildings on clay were all destroyed, those on the slopes of the Almada sands and limestones suffered severely; whilst, on the contrary, all the buildings on the Hippurite limestone, and the basaltic rocks escaped entirely, the line at which the force of the earthquake ceased to be destructive corresponding exactly with the boundary of the softer and less coherent Tertiary beds. The same kind of thing happened in Jamaica, Messina, Calabria, San Francisco, Talacahuano, &c. We must be very careful in drawing conclusions from these facts, however, for there can be little doubt that where the less coherent beds are of great thickness the elastic waves and vibrations become absorbed to a large extent by the friction amongst the particles, and the movement is almost entirely arrested before reaching the surface. In a sand or clay district the effect of a shock depends a great deal on the depth at which the solid rock is found beneath the surface; loose materials, such as gravel and coarse sand, resting on hard strata, should always be avoided if possible.

NOTES.

THE news imparted by Lord Salisbury at the Royal Academy dinner, that an unknown benefactor had undertaken to erect a building for the National Portrait Collection at his own cost, if a site were provided, is certainly a most gratifying one, and such as might well draw forth "loud and prolonged cheers," and we may readily believe with Lord Salisbury that the name of this generous and modest donor will not long remain unknown. Still the satisfaction one feels at the prospect of at last seeing something done for our National Portrait Gallery is not unmixed with regret that, in a country like this, such a work should be left to private means, owing to the fact that our Government actually, we believe, *dare* not spend public money for such a purpose; such is the national indifference to art of the public of whom Ministers and members of Parliament are the representatives.

THE Theatres (County of London) Bill brought forward on Wednesday by Mr. Dixon-Hartland, and withdrawn, was no doubt totally illogical in its proposal to make the Home Office responsible for the safe condition of the London theatres, the Home Office being a State and not a municipal institution; and it is difficult to understand how any experienced member of Parliament could have made the mistake of suggesting that a State department should be asked to act as a local municipal authority. We quite concur, however, in much that was said as to the importance of a more rigorous and complete system of reform and supervision over London theatres in regard to safety of construction and arrangements for ingress and egress; and we hope the London County Council will take the matter in hand in a thorough and efficient manner, and appoint a sufficient number of officials, acting under authority, to keep a constant eye on the working of theatres in these respects. There is no doubt that there are some very unsafe theatres in London still, in spite of regulations which have worked some improvement. It was not quite fair for Mr. Webster, in urging the matter on the County Council, to refer to the officer of the Board of Works as having "neglected his duty" in regard to the supervision of theatres. There is no evidence whatever that Mr. Hebb neglected his duty as to enforcing the regulations of the Board; the evidence is the other way: he was only accused of making an improper use of his position to obtain orders for theatres, and not seeing the impropriety of it. But every one who had to do with Mr. Hebb in regard to building regulations knew that he enforced all that it was his duty to enforce, in the strictest manner.

THE case of King *v.* Dickeson, recently decided by Mr. Justice North, is one which has a practical bearing for those who are developing building estates. A number of lots were sold, and the purchaser of each lot entered into a restrictive covenant with the vendor not to build on his lot beyond a specified building line. The purchaser of one of these lots mortgaged a portion of it. The mortgagee had notice of the above covenant, but no express restriction was made by the mortgagor. The mortgagee foreclosed, and ultimately sold part of the lot to the defendant, who also had notice of the restrictive covenant, but again there was no express restriction on them. They built beyond the line, and the mortagor thereupon had to enforce the covenant. But in this the court would not assist him. "There was no agreement," said Mr. Justice North, "between the plaintiff and his mortgagees as to the user of the land comprised in the mortgage, and though, no doubt, the mortgagees took the land subject to the obligations then existing in respect of it, and therefore subject to the right of the owners of the other lots to compel the observance of the restrictive covenant, there was nothing to prevent the defendant from building upon it in any way he pleased, provided that none of the owners of the other lots objected to his doing so." The moral, of course, is that the mortgagors should have a restrictive covenant inserted in the mortgage deed.

AN important question as to private rights over street architecture has been raised by Professor Baldwin Brown, who, in the columns of the *Scotsman*, has called attention to an unsightly addition which is in the course of being made to one of the dwelling-houses in Charlotte-square. Each section of this square is designed in a palatial manner as if it formed one instead of a number of residences, and it is a good example of its kind. Professor Baldwin Brown says:—"The northern block in Charlotte-square is, in a sense, as much a public possession as the Register House, though it happens to be made up of private dwellings. If the owners of these desire to exercise proprietary rights over their portions of the structure, and if their action involves, as in the present case, a serious damage to the general architectural effect, then civic authority should certainly interpose. The Dean of Guild Court is obviously the proper quarter to which to look, and is a body on which we ought to be able to rely to safeguard the interests of the citizens." Sir W. Fettes Douglas, P.R.S.A., has written equally strongly in the same sense. The right of a private individual to do what he likes with his own property has, for a long time, been a vexed question, but as the legislature have stepped in to prevent the pollution of rivers by proprietors on their banks, there seems no reason why proprietors who would spoil what may be called public architecture should not be also subject to control.

THE new number of the *Antike Denkmäler* just issued by the German Archæological Institute is full of subjects of interest. The plates, as usual, are impartially divided between architecture, sculpture, and the minor arts. The first plate is a restoration given by Drs. Kawerau and Dörpfeld of the temple of Roma and Augustus, to the discovery of the foundations of which we last year drew attention. It will be remembered that certain portions of the architrave bearing the dedication of the temple have been known since the days of Cyriac of Ancona, and the fact that this architrave is a segment of a circle, on plan, has greatly facilitated the restoration. Dr. Kawerau holds that both architrave and cornice are modelled after the pattern of the Erechtheum, and, on the strength of this, attributes to the temple several Ionic capitals lying scattered about near at hand. The article on the Roma temple is appropriately followed by a short notice, with two accompanying plates, of the temple of Divius Julius and the arch of Augustus in the Roman Forum. The next two plates are devoted to archaic art. In the one are beautiful coloured *fac-similes* of the capitals of two votive columns found in the recent excavations. The other gives what will be of even greater general interest, a coloured reproduction of the remarkable "Head of a Triton," to which we have more than once called attention. The vivid dark blue and emerald green with which this extraordinary head is freely coloured are very startling, but if our memory serves us, perfectly faithful. Of the remaining plates we can only note that among their number is an excellent phototype of the new Praxiteles head of Eubouleus, and also a complete reproduction of all the Tegea fragments of Scopas. Last, but by no means least in interest, the department of vase-painting is represented by the publication of a vase from the Bologna Museum, on which is depicted the return of Hephaistos to Olympos. This vase is of special interest because of the presence of the seated Hera bound by invisible chains to her seat, a factor in the scene frequently omitted.

THE current number of *L'Art* contains a great many sketches of works at the *Salon* exhibition, and facsimiles of studies of separate figures and groups for various pictures, reproduced from original sketches by various painters. Some of these latter are of great interest.

WE referred last week to the decision in the limited competition for a new library for the parish of St. Luke Chelsea, mentioning the award of the premiums. As the joint architect of one of the premiated designs is officially connected with this journal, we thought it better to decline any detailed criticism or comparison, which moreover, in regard to any practical effect it might have had on the choice of a design, must in any case, we presume, have been thrown away, as the decision was made and communicated to us before any criticism on the collection of designs could have been published in our columns. We desire to point out emphatically, as we have done in former cases, that to exhibit competition designs and invite public comment on them after the decision is made is a mere farce; and that if the promoters of competitions pretend to have any regard to public criticism on designs submitted in competition, they should invite such criticism *before* and not after they have settled everything. In the present case, without necessarily implying any dissent from the selection made, we may point out one or two defects in the design which we presume is to be carried out, which may be capable of being amended. (1.) We very much doubt whether the rooms which are shown lighted by rather small windows above the line of bookcases, *i.e.* about 8 ft. from the floor, will be found to be adequately lighted for reading: (2.) The magazine room, which is at present partially lighted by windows on the side where future extension is intended, will certainly be deficient in light in the centre whenever those lights should be removed: and (3) the windows on the ground and first floors on the principal elevation are treated in an entirely different manner, the lower windows being divided up into small square panes while the upper ones have large sheets of glass unbroken by cross-bars. These two window treatments are entirely different in character and do not seem to belong to the same design.

THE managing committee of the Clyde Trust definitely decided, at a recent meeting, on one of the various competing designs of ferry-boat for cross-river communication. An order for a pioneer vessel has been given to Messrs. Simons & Co., the designers, and the work has already been

some time in hand at the Renfrew yard. This new traffic ferry-boat, the first of a series to be built for cross-Clyde communication, presents several novel features, both ends being exactly alike in form and in equipment of rudder and twin propellers. The vessel moves either way with equal facility; the necessity of "swinging" for a start is quite done away with; and it is claimed that a great command is obtained over all the varying movements essential to a craft of the sort working on the cross-section of a busy up-and-down navigation. The length is 70 ft., with a beam of 43 ft. The bottom, or floor, is very flat, and the level of the lower, or fixed deck,—if it may so be distinguished,—rises but little above the water-line. The upper or traffic deck is movable, rising from the rigid portion of the framework below in proportion to the gradual fall of the tide, and in like manner descending when the rise of the tide requires it, so as always to present a deck level with the quay. These motions are directed by a pair of engines which are distinct from the propelling machinery. They act by means of worm gearing on vertical screws of steel, fixed to perpendicular standards, which rise from the central portion of the hull, three on each side. These massive uprights are securely strapped the one to the other by ties of steel-work stretching fore and aft along the summits, and by powerful girder bars of the arc form bridging each pair transversely, the whole being stayed to port and starboard by equally strong downward continuations, which are bedded in the solid framework of the gunwale. The central portion, fore and aft, of this movable deck, between the uprights, is for horsed traffic, the capacity being equal to eight carts with their cattle; while the narrower wings outside the uprights are for foot passengers, on a scale of 120 persons each crossing. This composite deck extends the entire length of the boat, the central or wheel portion occupying about one-third of the full beam, and communicating with the quay top along gangways hinged to the ends of the deck, these being raised and lowered by hand. Propelling power, acting by means of twin screws at each end (four propellers in all), is supplied by two pairs of compound surface condensing engines, placed, with their boilers, below the water-line, and thus contributing to a general rigidity which, of course, is apt to be impaired when towards low water the traffic platform gradually ascends to its loftiest position. One thing in favour, however, of a system of the kind in this particular application is the very moderate range of tide obtaining on the Clyde, which is only 9 ft. 9 in., as compared with 18 ft. on the Thames. The estimated cost of one vessel of the above type is 15,000*l.*

SOME correspondence has lately appeared in *The Times* with respect to the impending sale, for building purposes, of Wandsworth Manor House. The writers state that the house was built by Sir Christopher Wren, that Sir James Thornhill painted the staircase ceiling, and wall panels, and that the Princess Anne resided therein for several years after her marriage, until she ascended the throne. We may add that the grounds, covering about five or six acres, lie on East-hill, near to the slope which used to be known as French Horn-fields, after the tavern by that sign, and those of the Fishmongers' Almshouses, which were originally established at Newington Butts. Either wholly or partly within this parish,—watered by Pope's now no longer "blue transparent Vandalis," a stream once famed for trout, "for which I love to angle above any fish," quoth Izaak Walton,*—were situated four manors, namely, Allfarthing (Garratt); Battersea and Wandsworth; Dunsfold, long held by Merton Priory; and Downe, or Dun-boys. The Wendelesorde of the Domesday survey was at that date held by one William FitzAnculf, son to Anculf, shire-reeve of Surrey, who is credited with having obtained possession by dishonest means. William I. bestowed the Battersea and Wandsworth manor upon the abbot and monks at Westminster. In 1291, under the valuation made for Pope Nicholas IV., the demesne was assessed as being worth 17*l.* After the dissolution, this manor passed to the Crown. Upon the death of Henry, Prince of Wales, his father settled it upon Prince Charles, who, in 1627, granted it to Oliver St. John, created (June 3, 1620) Viscount Grandison, of Limerick, and advanced to the English peerage on May 21, 1626, as Baron Tregoze, of Highworth, Wiltshire. Dying in 1630, he demised the manor to his nephew John, grandfather to Sir Henry St. John, elevated Baron St. John, of Battersea, and Viscount St. John on July 2, 1716, whose eldest son was Henry, the celebrated Lord Bolingbroke.* Frederick, third Viscount St. John, obtained an enabling Act to sell the manor to John, first Earl Spencer, in whose descendant it, we believe, now vests. Close by the manor-house, at the junction of the roads from Vauxhall and Clapham, and over against a house called "The Huguenots," is Mount Nod, a small triangular grave-yard, wherein are buried some descendants of the Protestant refugees who settled in Wandsworth after the Revocation of the Edict of Nantes in 1685.

* "Windsor Forest: The Compleat Angler," Chap. III.

THE fine stone-built Elizabethan house known as Wakehurst Place, situated a short distance northwards from Ardingley (*prius* Earthingley) in Lewes Rape, Sussex, is about to be sold. This house, famed for its interior, was built in 1590 by Sir Edward Culpeper. The property had passed by marriage into his family from the Wakehursts, of whom Richard was made a knight banneret at the siege of Caerlaverock Castle, by Edward I. in 1300. Sir William Culpeper sold it, in 1694, to Dennis Lyddell. In 1776 it was bought by Admiral Peyton, and of late years has been occupied by the Marchioness (Dowager) of Downshire. In Ardingley parish church, of *temp.* Edward III., and restored by Sir G. G. Scott in 1853, are some old brasses to members of the Wakehurst and Culpeper families, including one to Nicholas Culpeper (1510) and his wife Elizabeth (1500). Wakehurst Place, having been for some years previously untenanted and neglected, was rehabilitated about fifty-five years ago. The estate is more than 1,090 acres in extent, under cultivation.

* Died at the family house, Battersea, and buried in St. Mary's parish church, 1751.

A NEW book of illustrations of wall-papers, recently sent us by Messrs. Jeffrey & Co., deserves special mention for the high artistic character of the designs included in it, most of them the work of well-known decorative artists. The designs are arranged so that they can be either all unfolded in a long series, or can be turned over book-wise, the cover being arranged to open either way, back or front, so as to include a double number of designs on the pages, which are printed on both sides. In this form it makes a very convenient book of reference for the designs contained. The collection includes a good many designs for ceiling-papers, which for the most part are rightly kept rather light and open in design; a heavy and much filled-up design on a ceiling tends to lower the apparent height of the room, and therefore should be avoided. Indeed, it is rather a question whether the use of ceiling-paper, though it gives richness and completeness to the decorative effect of an interior, has not always certain inevitable drawbacks, especially in reducing the light reflected from the ceiling. Among the ceiling-papers the "Wreath" and the "Daisy," both designed by Mr. Lewis F. Day, are very graceful in design and well-suited to their intended position; and a ceiling design evolved from shell forms by Mr. Walter Crane is very original and effective. Mr. Crane's "Dove" ceiling, with alternate light and dark panels, the darker ones containing a dove with outspread wings, and the lighter ones a small sprig of conventional foliage, strikes us as too heavy in effect for a ceiling-paper; and the same objection may be suggested to the "Bartolozzi ceiling" by Mr. Brophy. Mr. A. Jonquet's Louis XVI. ceiling is good and light in design. The wall-papers, properly so called, include some splendid designs by Mr. Crane, Mr. Day and Mr. Sedding, and among the less sumptuous examples a "Flower Scroll" by Mr. Brophy is a very good example of conventional floral design, free and flowing in line, but filling up the surface completely, and producing a broad and rich decorative effect. The book includes also some fine designs for staircase-papers.

MR. TADEMA'S large picture, "A Dedication to Bacchus," now on view at Messrs. Lefevre's Gallery in King-street, St. James's, has been painted, we are given to understand, as a companion to the picture of "The Vintage Festival" painted a good many years ago. It is the same size (a larger size than the average of the artist's works), and of course in subject has a direct relation to that of the earlier painting. The scene of the dedication is laid on a marble platform adjoining a temple, a portion of the sculptured podium of which appears on the right. Over the balustrade is seen a dark sea—too dark in colour and (as we have said of another painter's sea in a classical subject in the Academy) not recognisable as sea except from its position in the composition and its horizon line. On the right is the altar of Bacchus with a small phalanx of ministrants ranged on either side of it: opposite the spectator is a company of people coming forward; in the centre of the foremost rank is a little naked child, a girl of six years old or so, behind whom are her parents and her aged grandfather, and who, so we are informed in the prospectus (for the painting hardly conveys the information), is the person who is to be "dedicated to Bacchus." Such is the subject to which an artist of the highest technical ability considers it worth while to devote his powers. To those who think at all about the meaning of a picture we should imagine that this spectacle of a child in the naïve and fresh innocence of infancy being dedicated to Bacchus—knowing pretty well what the worship of Bacchus in ancient Greece meant—was a melancholy, even a painful subject to make a picture of: it certainly is so to us. Apart from this consideration, the painting is one of Mr. Tadema's finest works. The figures have more variety of character and interest, as personalities, than in some of the artist's works, there is more human nature in them and less of mere drapery of models in antique costume; and the colour, brilliant in general effect, is perfectly harmonious as a whole, and entirely without crudeness or harshness in detail. A fine point in the picture is the slight—very slight indication of a reflected tone of the blue sky in the marble pavement, a thing which an inferior painter might have been tempted to exaggerate. All the architectural details are painted with Mr. Tadema's usual unequalled realism and force. It seems a pity that all this splendid workmanship should not have gone towards illustrating some noble subject—some action in human history worth illustrating and commemorating.

ARCHITECTURE AT THE ROYAL ACADEMY.—II.

THE first-numbered drawing in the show we have already commented on, and will proceed to notice others in the order of hanging, omitting those which suggest nothing for comment.

1816 "Views in Hall, Byrkley, Burton-on-Trent:" Mr. R. W. Edis, we presume owes its position on the line to the architect's name, and to the fact that it represents a respectable classical entrance hall; the character of the drawing, hard, scratchy, and mechanical, would probably have excluded it had it come from any one without a name, and its position on the line is a mystery. We should have passed it over altogether but for the occasion of commenting on the curious idiosyncrasies of hanging which are characteristic almost always of the Architectural Room.

1817 "Houses at Ascot and at East Hill, St. Lawrence-on-Sea": Messrs. Ernest George &

Peto. Brown ink drawings slightly tinted, in the usual artistic style of execution in which the drawings which go by the name of this architectural partnership are got up, and in which the attempt to make new houses look like old ones is most successfully carried out. It may be questioned whether the effect of the actual buildings, in this respect at any rate, comes up to that of the drawing.

1818. "The New Library of the People's Palace": Mr. E. R. Robson. An interior of a large octagon room with a central skylight, designed as if constructed on the principle of intercepting vaults used in some of the Indian domes, but whether this is the real construction, or only an architectural *façon de parler* in plaster clothing, there is nothing to show. The visible ribs of the design are broad, flat, and panelled, with circular medallions and crossed mouldings interrupting the panel at intervals: no very recondite manner of decoration. At the principal intersections of the ribs are circular medallions in relief, as bosses, from which long lamp-stalks depend. The lower compartments of the roof form semicircular wall arches without ribs or moulding of any kind, filled in with three-light windows with a large circular-headed compartment in the centre and a smaller square-headed light at each side; the centre light crowned with cornice, brackets, and curly-wurly pediments of the approved *rococo* style. The walls below the roof-springing are occupied by book-cases, with a gallery of communication in the middle of their height. The book-cases are interrupted by plain square piers in each angle of the octagon, decorated just below the springing with a niche containing a bust of an eminent author: these busts are illustrated separately at the sides of the drawing; they are those of Chaucer, Johnson, Dryden and Scott at one side, and Shakespeare, Milton, Byron and Wordsworth at the other. Spenser and Pope have far more claim, as there were only positions for eight, than Johnson and Dryden. The idea is a good one, but it is to be hoped that the actual busts as executed have more character and force than the drawings here convey; those of Byron and Milton, in particular, are exceedingly weak and characterless. In the main the room seems well adapted for its practical purpose, but one must regret that "the people" should be presented with architecture which exhibits such merely commonplace elements of design and detail.

1819 "Rhinefield, Hants": Messrs Romaine-Walker and Tanner. A very picturesque, long, straggling Tudor-Gothic house, with a block plan which gives a kind of vague clue to the arrangement; it is obvious that the right-hand wing represents the living-room portion of the house, and the large octagon bay-window is probably the drawing-room; what seems to be a carriage entrance to a small courtyard is seen further to the left, with a square tower rising over it; and we presume that the block to the left of this, round a large quadrangle, and which shows only small windows high up in the wall, is the stable and coachhouse portion of the establishment, the architecture of which thus tells its own tale to a creditable extent. The sketchy indication of shrubbery in the foreground, by a mass of shading lines, is far too roughly done, considering what a prominent part of the foreground it is, and tends to spoil an otherwise good drawing.

1822. "The Wise and Foolish Virgins; design for decoration of a church": Mr. Joseph W. Forster. Hung too high to be well seen, but looks good in a decorative sense, though rather naïve. The two companionships of virgins are represented extended frieze-wise on either side of a door which opens in the wall and shows the blue of heaven through: a pretty fancy.

1823. "Decoration; boudoir:" Mr. John J. Shaw. We have seen other decorative work by Mr. Shaw which is good, and therefore presume this may be so; but it is hung too high to form any idea of it.

Mr. Holiday's fine design, No. 1825, we have already spoken of. 1826, "Flixton Hall, Suffolk, south elevation," and 1833, west elevation of the same, by Mr. Fairfax B. Wade, are delicately-drawn pencil elevations, coloured to distinguish brick and stone, of an Elizabethan house which, from the plan which the author has commendably appended, appears to consist of some portions of an old house retained amid a large amount of addition or rebuilding. In the west elevation the side of a conservatory addition is shown with large Tudor-arched windows, and possibly with a glass roof concealed behind the battlemented and pinnacled parapet; behind this is a central bay window through two stories, with a very elegant clock stage and lantern over it. The chimneys are of the usual Elizabethan type, with variously ornamented chimney-tops, the windows mostly square-headed mullioned openings. A rich effect is produced by the double row of panelling under the battlements of the principal cornice. The whole is marked by unexceptionable taste and refinement in style and drawing.

1827 "Newnham College, Cambridge:" Mr. Basil Champneys. Three pen drawings, the first showing sketches of Old Hall, 1873; and Sidgwick Hall, 1880; the two other views of Clough Hall, which we presume is the *raison d'être* of the drawing. The main front is a very quietly-treated building of Queen Anne type, thoroughly "Collegiate Domestic" in character; the only portion presenting any originality of treatment is the exterior of the dining hall, which may be said to be Gothic architecture carried out with Classic details; there are buttresses which break off into colonnettes above and finally terminate in inverted consoles, and between them round-headed windows under deeply-recessed arches which partly stop against the buttresses; towards each end of the hall is a large semicircular projecting bay, entirely glazed, and with a domical cupola, the front portion projecting slightly from the semicircle and finished with a pediment head. This dining hall is an exceedingly pretty bit of thoroughly Collegiate architecture.

1829. "Museum in the Public Park at Baroda:" Mr. R. F. Chisholm. A pen-and-ink elevation of a building in Indian style, with a domed central octagon feature over a central hall, to which access is gained by an external flight of steps leading to the principal floor level; the museum buildings extend right and left on either side of the central hall, protected from the heat by being recessed behind colonnades in the ground story; the "columns" are simply square piers running flush into the architrave, the openings decorated below the architrave by a hanging pierced work filling up the upper portion. Above this is a low frieze and over that a row of small square windows with colonnettes between; over this comes the main cornice and balustrade, behind which the inner or main line of wall rises with larger windows. The colonnade and frieze, &c., are stopped at each end by angle towers terminating the composition. The design is an effective application of the elements of Hindoo architecture, picturesque in effect and expressing its purpose well.

1830. "Cloisters, Gloucester Cathedral": Mr. C. E. Mallows. We have already referred in passing to this as a good example of picturesque perspective sketching in pencil: it may be questioned however whether it is justifiable to leave out so much of the detail of the piers and leave them entirely light as against the wall seen at some distance behind them; it is pardonable perhaps in a sketch (which this is, rather than a drawing), but though it produces a bright and sparkling effect, it is not *true*.

LETTER FROM PARIS.

IN spite of pessimist prophecies, the Paris Exhibition has after all been opened on the date fixed a long time previously; the opening ceremony has come off very successfully, and the inauguration of this vast undertaking is certainly one of the most striking indications in recent years of the remarkable vitality of France. The success of the enterprise so far is mainly due to the energy of a few men; especially to M. Georges Berger, whose energy and talent as an administrator had already been proved when he filled the post of Commissaire Général des Sections Étrangères in the 1878 Exhibition; to M. Grison, the director of the financial element in the enterprise; and to M. Alphand, who has so long laboured for the artistic improvement of Paris.

The French Government has not forgotten to give its official recognition to those who have laboured in the cause. M. Alphand has been created "Grand Croix" of the Legion of Honour, M. Berger "Grand Officier," and M. Grison and M. Chas. Garnier "Commandeurs." Among the new promotions to the degree of "Officier" are M. Bouvard, the architect of the central dome and the "Palais des Industries Diverses"; M. Formigé, architect of the Palais des Beaux Arts and the Palais des Arts Libéraux; M. Dutert, architect of the Galerie des Machines; M. Eiffel, whose title to honours will be questioned by artists, though not by the populace; and M. Lavastre, the decorative artist of the central dome. The lesser recognition of "Chevalier" has been accorded to M. Gratigny, inspecting architect under M. Bouvard; to M. Compagnon, the director of works on the Eiffel Tower, and to M. Délions, who acted as resident engineer on the work.

The impression produced by the spectacle of the opening, of the immense extent of buildings and the vast crowd that congregated, was very striking, but withal somewhat confusing to the memory, for the whole affair was too large to allow of studying it in detail; we can only give a kind of general record of the impression of the ceremonial.

For the whole of the week preceding the opening, the whole district extending from the Pont de la Concorde to the Pont de Grenelle, including on the left bank of the Seine the Quays, the Esplanade des Invalides, the Champ de Mars, and on the right bank the Trocadéro and its gardens, were occupied by crowds of workers in a state of what may be called feverish hurry. Thousands of workmen, representing all kinds of racial types of humanity, were engaged in completing their installations, while M. Alphand's army of gardeners put the finishing touches to the plantations, and transformed into an immense *place*, adorned with plantations and flowers and statuary, what had but a day before appeared an almost hopeless confusion of *débris* without a place for the sole of the foot-passenger. By dint of prodigious efforts, when the cannon on the opening day announced the arrival of the Head of the State, the spectators had at least the optical illusion of a completed exhibition before them; an optical illusion only, be it understood, for there is a very great deal to be done yet; but on the occasion of the official visit the crowds of unopened cases were duly masked behind decorative hangings and other concealments, as well as by the crowd forming and following the *cortège* itself.

Apart from this prosaic fact of the state of things behind the scenes, which cannot be denied, the affair was a great success. The weather seemed to be as complimentary to a President of the Republic as it is said in other countries to be to Royalty; and a splendid sun was shining when, at 2 p.m. precisely, the President entered the space under the central dome where all the high functionaries of the State, and of the *personnel* of the Exhibition, were assembled to receive him, as well as numerous representatives of foreign Powers, whose varied and brilliant costumes added to the picturesque effect of the scene. There were two speeches only, that of M. Tirard, President of the Conseil des Ministres, and Commissaire-Général of the Exhibition, and the reply of M. Carnot, who was much applauded at several points in his speech, especially in his expressions of cordial welcome to the foreign visitors.

After these two speeches, and while the Colonne orchestra played, the *cortège*, marshalled by MM. Alphand, Berger, and Grison, entered the Galerie des Machines, which is the most complete portion of the Exhibition, and after traversing the aisle between the long ranks of machines of various types, the President entered the Salles des Industries Diverses, and proceeded thence to the Palais des Beaux-Arts. Here the procession came to a halt under the dome where the pictures forming the Centennial Exhibition are collected, and here the President was entertained at lunch by M. Meissonnier and M. Proust, while the band and chorus, conducted by M. Dambé, gave several pieces of music, including, as specially appropriate to the occasion, the "Marche Républicaine" composed by the late Adolphe Adam. After this, a visit to other sections took place, and the procession traversed the length of the Palais des Arts Libéraux up to the Eiffel Tower, and came back to its starting-point before the central dome. There the President entered a carriage with MM. Tirard, Alphand, and Berger, to visit the sections of Agriculture and Alimentation, and arrived at last at the Esplanade des Invalides, the termination of this long promenade. Here he traversed with his escort the central alley, which was covered with a red and white awning, paused a few minutes at the Palace of the Ministère de la Guerre, and then visited the exhibitions representing Algeria, Cambodia, Annam, and Senegal, filled with various colonial troops in picturesque uniforms. It was with some difficulty that the procession could make its way through these courts, filled with a

motley crowd of natives of the various countries represented, of all shades of colour and in the most picturesque dresses of a brilliant polychromy, who crowded round the Presidential carriage with loud acclamations. It was now six o'clock, and M. Carnot quitted the Exhibition, which was then taken possession of by the army of sightseers, whose first move was to carry by assault the various dining-rooms and restaurants, where there was no little difficulty in keeping pace with the demands of this crowd of hungry visitors.

While we were "assisting" at this spectacle of a scramble for food, at which, for a good many of the spectators, curiosity served to keep off the recollection of hunger, the gardens were illuminated, and the central dome burst into many-coloured lights. Opposite to it the Palace of Trocadéro was illuminated with fairy-like effect. Above a maze of electric lights in the gardens and shrubberies, looking like fiery flowers, rose the enormous mass of the Eiffel Tower, blazing with Bengal lights and sending from the top its powerful electric light over the scene. No description could give an idea of this really incomparable piece of spectacle, which was further heightened by the play of the fountains with waters variously coloured by electric rays, red, yellow, blue, green, and violet.

Beyond the Champ de Mars, the Seine, covered with craft of all kinds, offered the spectacle of a Venetian fête, from the Pont de Grenelle to the Ile St. Louis. Numerous illuminated vessels circulated between the two lines of lights on the banks, amid the sounds of military bands, and the whole scene, with the bridges also all decorated with garlands and lights, formed a wonderful framework to the further illuminations of the Panthéon, the Louvre, Notre Dame, the Institut, the Hôtel de Ville, and other public buildings, which were all lined and profiled with lights.

Such is a brief *résumé* of this festal day of May 6; a splendid picture which those who saw it were unwilling to quit. When we had returned to the centre of the city, where popular rejoicing was also in full swing, the sky to the south looked as if reddened by a conflagration, with the electric light on the Eiffel Tower shining like a great beacon above.

Having given this brief account of an opening *fête* so far superior to that of the 1878 Exhibition, let us add some scraps of practical information in regard to the Exhibition. First as to the important subject of entrance arrangements. In this Exhibition there is a complete absence of turnstiles, and the public can enter freely during the day on presenting at the gate a one-franc ticket, which is purchased in advance. In the evening the price of entry is doubled. The entrances themselves are disposed in the following manner:—The Seventh Arrondissement, that is all the portion adjoining the Esplanade des Invalides and the portion east of the Champ de Mars (Faubourg St. Germain) has thirteen main entrances and nineteen wicket-gates (*guichets*). In the Fifteenth Arrondissement, west and south of the Champ de Mars (Côté de Grevelle) there are four entrances and eight wickets. In the Sixteenth Arrondissement, next the Trocadéro, there are five entrances and ten wickets.

As to the amount estimated from entrance payments: for that portion represented by the coupons or vouchers of subscribers to the Exhibition through the Crédit Foncier, it is estimated that there should be 30 millions of visits, representing an equal number of detached subscribers' coupons. Adding to these some millions of visitors with the tickets purchased at the different repositories, the total takings must certainly very much surpass those of any former exhibitions, where the number of entries did not rise above 12 or 14 millions.

As to the Eiffel Tower, the monstrous centre-piece of this gigantic show—the architectural aspect of which it would be unkind to criticise any more now that it is done (and perhaps M. Eiffel's illusions are dispelled by this time), the tariff is fixed at two francs for the first platform, three francs for the second, and five francs for the summit. Contrary to ordinary custom here, these prices are to be lowered on Sundays, when it will be one franc to the first platform, 1·50 to the second, and two francs to the summit. The tower is estimated to be capable of finding room for 6,000 visitors at once on its first platform, 1,500 on the second, 500 on the summit, and counting in those who may be on the way up or down, and those in the service of the Restaurants, there may be about 10,000 persons at once accommodated in this gigantic iron toy which towers over all Paris, crushing the life out of all the architectural monuments below it, and producing on us residents, who cannot avoid seeing it always and from all quarters, the effect of a nightmare.

On the eve of the opening of the Exhibition was held the ceremony organised at Versailles in memory of the meeting of the États-Généraux in 1789. We cannot undertake to give any special account of the ceremonial. It was inaugurated by fixing a tablet, commemorating this historic event, on the façade of the "Hôtel des Menus Plaisirs," now become merely a barrack. Then followed a visit to the Palace and an inauguration of the "Bassin de Neptune," now completely restored; a piece of work which was begun nearly ten years ago, and has cost 500,000 francs. Thanks to the new architect in charge, M. Marcel Lambert, the complete repair of Versailles is now actively proceeding. The façade of the Pavillon Dufour, facing the Pavillon Gabriel, has been rebuilt, and also the Cour de Marbres is nearly complete in its restoration and repair. But as a certain number of celebrated pictures have been temporarily removed to be placed in the "Exposition Retrospectif," notably the "Coronation of Napoléon I." and the "Battle of Taillebourg," by Delacroix, there are melancholy gaps on the walls of the splendid saloons, ill-concealed by hangings of green cloth.

The opening of the Exhibition will have, among other good results, that of pushing on the electric lighting of Paris. The installations now nearly complete include six segments of a circle, extending from the centre to the circumference of Paris, and corresponding to an equal number of companies who have obtained concessions. The most advanced is the Edison Company, whose machinery is established in the basement of the Cour du Palais Royal.

Amid the excitement about the Exhibition, the opening of the *Salon* on the 1st attracted less than usual notice. There was, however, the usual crowd on the "Jour de Vernissage," and numerous visitors during the first days of opening, especially on the Sunday. Of the architectural exhibits the *Builder* has already given some account, and of the paintings and sculpture we shall have something to say in a special article hereafter.

The Musée de la Révolution, organised in the Salle des États, has proved but a meagre attraction. In spite of the presence of the sword of the "Grand Carnot" (grandfather of the present President), and of a certain number of curious drawings and autographs, the collection is chiefly interesting to antiquarian students, and the crowd prefer to take their money to the Champ de Mars, rather than to this necropolis of the Revolution. Not far from here, in the Garden of the Tuileries, there will open almost immediately the panorama by MM. Gervex and Alfred Stevens, who, aided by a number of younger artists, have represented all the celebrities of France from 1789 to the present day. The scene is laid in an architectural *ensemble* very well designed, and through the porticoes and colonnades which surround the spectator are seen the Avenue des Champs Elysées, the Place de la Concorde, and the Tuileries. There is a marvellous collection of portraits arranged with great attention to general composition and to correctness of costume, and it will probably be a great success with the public. We cannot promise as much for the "Tout Paris" of M. Castellan, installed near the Colonial Exhibition on the Esplanade des Invalides. Here the point of view chosen is the Place de l'Opéra, with the avenues converging on it. Most of the celebrities painted by the artist are rather doubtful likenesses; the personages are treated rather in caricature, and have no appearance of reality, the *sine quâ non* in a panorama. The artist had placed General Boulanger in the front rank of his portraits, but at the instance of official remonstrances of a rather threatening character the General has been suppressed, and his place taken by the Shah of Persia!

We have no space to say anything special as to the exhibition of the pastellists in the Galerie Georges Petit, arranged under the direction of M. Roger Ballu (besides that a very complete collection of the works of the same artist is to be found in a little pavilion in the Exhibition), nor of the "Cercle de l'Union Artistique," which is splendidly housed this year in the old Cercle Imperial in the Champs Elysées, except to mention a fine portrait by M. Elie Delaunay, who has been elected chief Professor at the École National des Beaux Arts, in the place of Cabanel.

M. Pascal, we may also mention, has been appointed Inspecteur-Général des Bâtiments Civils, in place of the late M. Questel. M. Juste Lisch, the architect of the Gare St. Lazare, has just received from the President the cross of officer of the Legion of Honour, a recognition well merited by the ability and energy he has shown in carrying out this immense piece of work, with the terminal hotel attached to it.

From the first competition for the Prix de Rome in painting the following have been elected to take part in the final competition:—MM. Lavalley, Thys, Gervais, Abel Royé, Ernest Laurent, Chas. Lenoir, Derambet, Gorguet, Danguy, and Castaigne. The twelve competitors for the similar prize in sculpture have commenced their labours on a bas-relief of a given subject, on which the decision will be given at the end of July.

We have to record the death of M. Jobbé-Duval, the painter, at the age of 68. Felix Jobbé-Duval, who had recently quitted the Municipal Council of Paris,—in which he had sat since 1871, to direct the School of Design in the Rue Ste Elisabeth, was born at Carhaix (Finisterre), and studied successively under Delaroche and Gleyre. He devoted himself to historical painting, especially of religious subjects, and many of the churches of Paris contain works by him, commissioned by the State or the Municipality during the Second Empire. This class of subjects has fallen into much disrepute in France in these latter days, and the painter himself changed with the times, and became one of the most ardent Republicans and "libre-penseurs" of the day, and was interred without any of the ceremonies and prayers of the Church for which he had chiefly worked during the greater portion of his artistic career.

PICTURES AT THE ROYAL ACADEMY.

WHILE concurring with the opinion expressed by Sir F. Leighton at the Academy Dinner, that this year's exhibition is remarkable for the variety of style and aim represented in it, we do not think it will be generally considered to be a very strong Academy exhibition. There seems more than the usual proportion of pictures which, from the intellectual standpoint, must be pronounced entirely uninteresting, however respectable in execution; and others which are interesting in intention are not successful in execution.

Mr. Orchardson's large painting, "The Young Duke" (243), has perhaps the best claim to be considered the central work of the year: it represents a large *salon*, rich in architecture and decoration, in a Louis XIV. palace, where a crowd of figures standing round three long dining tables are toasting their youthful host, who sits at the centre table with an air of insolent patronage happily expressed on his countenance. The objects furnishing the table are painted with the greatest care and finish, and the whole is a fine example of that peculiar but rich harmony of colour, rather unreal, which Mr. Orchardson has invented for himself, and which seems to remain his own secret. Unless as a satire on selfish luxury (which is perhaps the intention), the picture is deficient in that moral point and significance which have distinguished Mr. Orchardson's paintings in previous years; it tells no story even, and there is a sense of inadequate motive as compared with the brilliant talent displayed in the work. Opposite this is the President's largest but not his most successful work, "Greek Girls Playing at Ball" (300), a terrace on which are two figures, a young woman in purple drapery in the foreground, who has thrown a ball, and stands in a rather oddly-contorted attitude looking after it, and a younger companion in light saffron drapery who stretches up on one foot to catch it, with a lightness and spring of action which are admirably expressed. The colour effect of the picture is most harmonious, but there is no realism of texture in any part of the painting; it is purely decorative, even to the dark sea in the distance, which is only recognisable as sea from its position in the scene. Realism, however, was no object in the painting. Sir Frederick Leighton's most impressive work is certainly "Invocation" (31), a three-quarter figure of an exquisitely beautiful young woman with her bare arms raised above her head towards a statue on a white fluted column just seen in the foreground; the figure is heavily

draped in white,—the semi-transparent drapery lifted behind her head, with the light shining through, giving the effect of a kind of aureole. A dark purplish curtain hangs as a background, over which the entablature of a Doric temple is seen in perspective. As a pure vision of abstract beauty this work is a great success. The President's other contributions are "Sybil" (25) a seated figure, a fine foil in colour and conception to the last-named, but by no means of equal interest, and a head entitled "Elegy" (187).

Mr. Seymour Lucas has done well in his painting of "The Surrender" (67) of a Spanish Don of the Armada to Drake, on board Drake's own ship; there is an air of reality about the scene, and the contrast between the aristocratic figure of the Spaniard in armour, delivering his sword with a stately courtesy, and the square-built figure of Drake in knee-breeches and stockings, with his back to the spectator, returning the Spaniard's bow in a stiff and clumsy manner, is very characteristic. The subsidiary figures of the Spanish retinue are the best, the English retinue being rather devoid of special character and expression. By a coincidence (or by arrangement?) Mr. Vicat Cole has given us the prelude to the same scene, in his large sea-piece called "The Summons to Surrender" (343), where we have Drake's ship in the foreground and the Spanish galleon in the middle distance, with a great deal of wind and movement in the picture, and a sea in which the foreground waves seem to be forced up into a "short sea" by the rebound from the hulls of the ships about, otherwise the shape and movement of the water is hardly accounted for. The sea, at all events, is not the best part of the picture, which as a whole is an impressive one, and to our thinking superior to the artist's "Pool of London" last year.

Mr. Alma Tadema's picture, in its usual place in Gallery III., is, like Mr. Orchardson's, a splendidly-painted work deficient in subject. It is called "The Shrine of Venus" (313), and appears to introduce us into some kind of side chapel devoted to personal adornment, as two young women are seated, one looking at herself in a glass; and a wig is seen balanced on a stand on the top of the dwarf wall, over which we see the heads of a crowd of people, and over them bits of temple architecture in bright sunlight, according to the artist's wont. The girl looking in the mirror has a splendid head, and the painting of architectural detail is perfect; but there is no intelligible incident to give an interest to the work. Mr. Poynter's "A Corner in the Villa" (291), also showing classic figures amid wealth of marbles and (in this case) mosaics, seems to be hung as a pendant or a challenge to Mr. Tadema's; the figures are of more grace, life and interest; but the marble is only imitation graining, in comparison with Mr. Tadema's achievements as a marble-mason. In regard to the latter, by the way, it is odd that he has represented the grain on the marble slabs facing the spectator as continuous from one to the other, although these are distinct slabs, sawn up, we may suppose, separately. Among the prominent pictures in the large gallery (we are neglecting landscape for the moment) is Mr. Gow's "Visit of Charles I. to Kingston-on-Hull 1642" (260), a crowd of horsemen under the wall with the Royal martyr on a white horse at their head, fruitlessly demanding entrance into his own town with the three crowns sculptured over the gateway (a good satiric hit); the figure and face of Charles are admirable, and will bear close inspection, and each member of the group of men and horses is distinctive in conception; there is a want of force in the foreground and in light and shadow effect, but this is one of the cleverest pictures of the year. Another very clever and amusing picture is Mr. Rivière's "Of a fool and his folly there is no end" (231), a painting with a high horizon, where a small troop of knights on their heavy chargers are thrown into confusion and sent helter-skelter down hill into the foreground on their startled horses by a motley fool on a donkey at the top of the rise swinging a bladder-rattle round his head; the spectator is almost looking down from above on the foreground figures, so that the foreshortening problem becomes a teazing one; the face of the "fool," about the size of a threepenny piece, is capitally and minutely made out: the only question is, was the joke worth all this trouble and talent? Mr. Rivière's other work is, in strange contrast to this, a scene of rising moonlight, "Pale Cynthia" (363), with a grand mass of cumulus clouds, and a shepherd and dog as small and unobtrusive foreground figures; the mass of clouds seems rather too yellow in tone for moonlight, but there is true poetic feeling in the picture.

Mr. Storey's "Godiva" (326) is in general idea and composition an almost exact repetition, on a larger scale, of a painting he exhibited a good many years ago, called we think "A Danaid"—a nude figure at the foot of a broad stone stair. It is a finely-drawn figure, redeemed from the regulation class of Godivas by a certain nobility of expression in the head; there seems to be rather a curious and unwholesome cold tone in the portions of the figure that are in shadow. In the same room is a very successful painting by Mr. F. D. Millet, "Antony van Corlear, the trumpeter" (378), from "Knickerbocker's History of New York," a picture which has distinctive merit as a capital realisation of the type of men and women of a past time; the "jolly, rosy-faced, lusty bachelor," and the plump Puritan women who carried on a respectable flirtation with him, are drawn to the life; the picture is one of the few which show real invention in human character as well as skill in painting. In the same category, and superior even of its kind, may be placed Mr. Stanhope Forbes's exceedingly clever picture "The Health of the Bride" (655), a wedding breakfast in humble life, which is pathetic, perhaps almost cruel, in its unflinching realism—in the portrayal of the commonplace charms of the poor bride, the beaming admiration of her mother, the stolid satisfaction of the bridesmaid who dips her cake in the wine; the action and expression of these and all the other figures are studied with an insight into character which is very remarkable, though the main result is a saddening one; a poignant contrast, by the way, to Mr. Orchardson's brilliant scene of feasting of another type. Another picture of humble life, with a pathos of a nobler kind, is Mr. Kennington's "The Pinch of Poverty" (734), a woman with her boy seated on the plinth of the railings in the street while the little daughter standing in front offers primroses for sale; the woman's face is most touching in its expression, and the additional element of harmonious composition in the lines and grouping of the figures, though unobtrusive, is not neglected.

Mr. Herkomer's "Chapel of the Charterhouse" (558), obviously a hint from Thackeray, representing the pensioners assembling for morning prayers, is a very strong realisation of the place and the scene, though the figures, we believe, are mostly portraits of persons who are little likely to claim the shelter of this ancient charity (a piece of rather questionable taste); but the picture is a great deal too large for the subject, whether in regard to its intrinsic interest or to the colour combination of large black-gowned figures against a background of varnished woodwork. The same room contains Lady Butler's exceedingly spirited painting of "French Cavalry leaving a Breton City on the Declaration of War" (578), with the peasants lining the road on either side to bid them God-speed, and the Mediæval gateway in the centre of the picture; a hard picture, inartistic in general effect, but full of interesting detail. Mr. Crofts, our best painter of battle scenes, is not at his best this year, and the only one of his three works which is a full success is that of "Hampden Riding away from Chalgrove Field" (523), the horse as well as his rider wounded, and seeming to stumble along in an aimless fashion. The painting of "The Knight's Farewell" (82) is intended to have a chivalric side about it, but the general effect is, unfortunately, rather stagey.

Mr. Swain's "The Prodigal Son" (136) is a painting of considerable power, though perhaps the main object in it was the painting of the swine, which are grouped round the bent figure of the prodigal, in the foreground of a dreary clouded landscape, the general aspect of which imparts a certain pathos to what would otherwise have been only a piece of animal and figure painting. Mr. Frank Dicksee's large picture of "The Passing of Arthur" (150) is mainly a successful study of moonlight effect, without the interest in the figures which the subject properly demands. Mr. W. H. Bartlett has painted "A Venetian Faction Regatta" (733), a large picture with a crowd of figures, telling its story in a very spirited manner; and Mr. F. Hall's picture of "Adversity" (676), a group of melancholy figures tramping through the snow with a cart, is noteworthy for clever drawing, pathetic purpose, and a remarkably true representation of a snow-covered road. Among the smaller paintings of what is sometimes called *genre* a very good one is Mr. F. Morgan's "Watching and Waiting" (1190), a small cottage girl in charge of a still smaller child, on the grass and screened by a large umbrella from the sun, which is pouring over the field beyond, both landscape and figures equally well studied; the same painter's "Wild Roses" (137) is also an admirable picture of children. Mr. Joseph Clark contributes several charming works, of which the most finished is "The Christmas Dole" (444); a smaller picture of children's devotions at bedtime (195) is very pretty. Miss Rae (now Mrs. Normand) is represented by a large painting of "The Death of Procris" (629) not equal to one or two of her former works, but the helpless drag of the wounded figure of Procris is finely delineated. Among smaller works of a half humorous nature is Mr. Maw Egley's "A New Acquisition" (639), a capitally-painted interior, where an old gentleman of ornithological tastes is rejoicing over the stuffed figure of a magnificent owl. Mr. Dendy Sadler's "The Widow's Birthday" (1228) shows three elderly gentlemen in late Georgian costume, rival suitors with presents, at the door of a house, where they regard each other with little concealed jealousy; the figures are in full sunshine, and the scene exceedingly light in colour. Among the scenes in rural life few are better than that entitled "Castles in the Air" (1202) by Mr. W. E. Norton, an idyll on the sand-hills between two young people in sabots.

Among pictures which from their size and the importance of their subjects will receive attention are Mr. Solomon's large canvas called "Sacred and Profane Love" (760), a sprawling composition of big figures, of which it may be said that it is a degree less vulgar than his "Niobe" of last year, with the same kind of technical merit. Mr. Hacker's "Return of Persephone to the Earth" (1102) belongs to a rather more refined order of Academical painting, but is very uninteresting. Mr. Reginald Machell's "Bacchante" (1131), a nude figure apparently tossed about amid a whirl of clouds, looks as if it had lost its way in going to the Salon, where it would certainly be more at home than at Burlington House. Miss Sassoon's "The Hours" (1152), an allegorical picture of a group of figures dancing round in a ring in the clouds, is meant well, but fails in regard to beauty of form or colour, which is the principal excuse for this kind of painting; the figures are stiff and devoid of inspiration. Mr. Chevallier Tayler's "The Encore" (1132) is a clever representation of the effect of artificial light on the figures on the platform at a concert in a private house, successful in its intention, but not worth doing on this scale. His smaller work, "Confidences" (387) is far superior to this. Mr. F. Goodall has posed a life-size nude wax model of the figure, with wide staring eyes, on a bank of raw green herbage (1245), and wishes us to accept that as Eve's first awakening to consciousness. A similar claim is made for a better-executed but even more prosaic and commonplace nude study by Mr. Val Prinsep (204). If painters can have a chance of reducing a great poetic ideal to absolute commonplace there are a good many of them, at all events, who seem not unwilling to make the most of it.

Among the portraits of the year certainly the most fascinating is Mr. Herkomer's "Lady Edea" (151), of which indeed the charm lies in the spiritual beauty of the lady's upturned face,

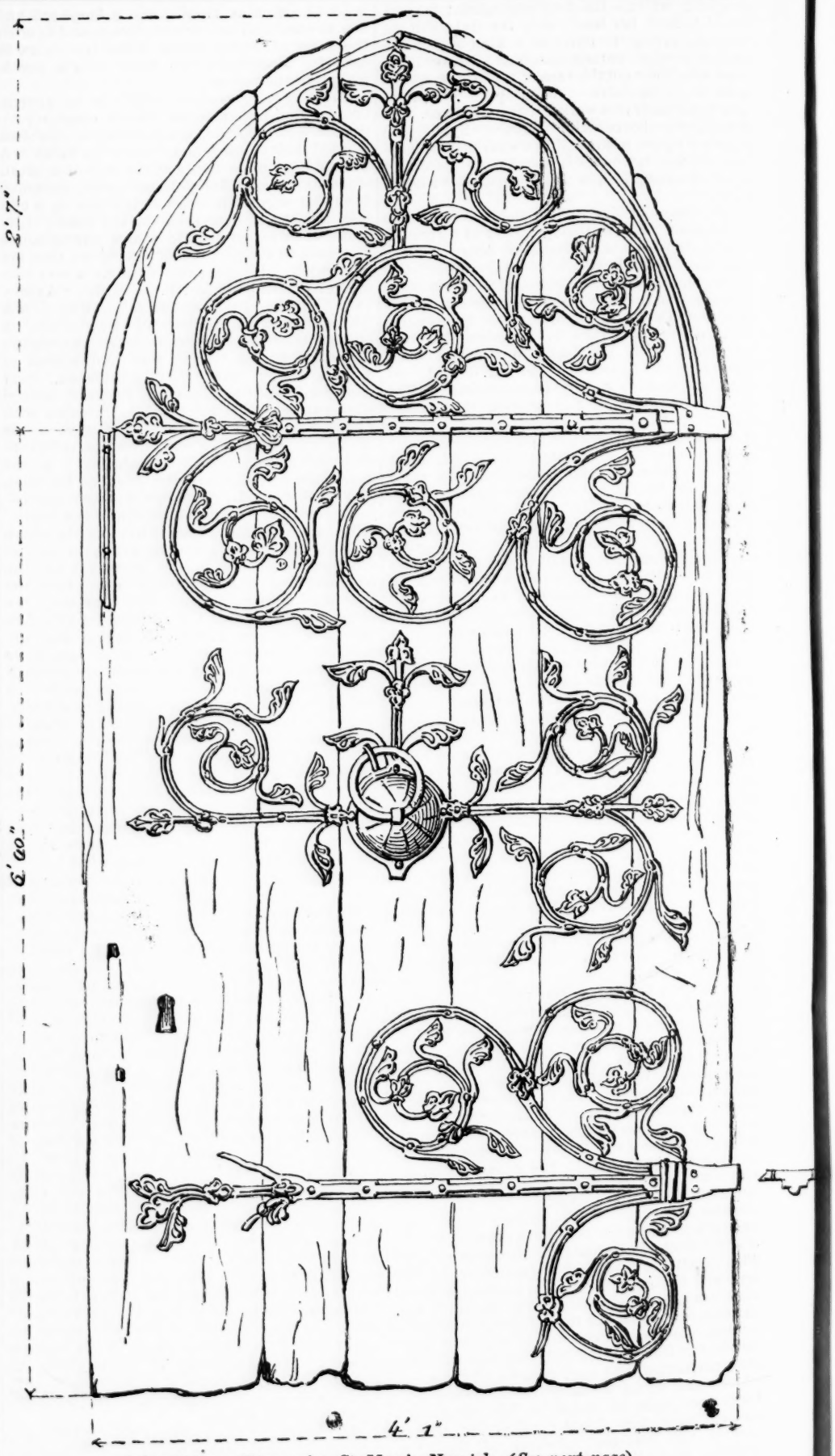
> "And looks commercing with the skies—"

but the painter has done justice to it, and the result is a noble work, far more poetic in feeling than most of the so-called ideal subjects in the Academy. A significant contrast to this is the finely-painted group *de luxe* by Mr. Fildes of two "Sisters" (372) whose looks are by no means "commercing with the skies," but rather taken up with their own impressive appearance in fashionably-designed white dresses with pinched waists, relieved against scarlet drapery and the old-fashioned marble column. We presume Mr. Fildes has produced the kind of thing he was expected to produce, and he has done it well and boldly in dealing with this strong effect of white and red—not, alas! Nature's own white and red, but that of the milliner and the upholsterer. A painter, like an architect, must we suppose please his clients sometimes. Sir John Millais must have been doing this in his one portrait (306), which is not likely to give pleasure to any one else, nor

much, we imagine, to himself. Mr. Solomon has a very clever thing, far better than his large painting, in the white-robed portrait of a little brunette child (393). Mr. Ouless has a fine portrait of Sir William Bowman (292), and Mr. Herkomer a very characteristic one of "Mrs. Gladstone" (205). The proportion of utterly uninteresting presentation portraits is, if anything, larger than usual this year. Among those that are of higher interest may be mentioned Mr. Ouless's "Lady Manisty" (172), Mr. Carter's "Colonel W. Hill James" (1133) a very spirited likeness of a man of striking features clad in a rich brown tweed suit with one bit of blue in the necktie; Mr. W. R. Symonds's "Portrait of an Old Lady" (1155), remarkable for the fine and delicate execution of the face, and Mr. Shannon's "Miss Colley" (1144) a half-length of a splendid young brunette in buff dress with an orange sash, a most effective and taking portrait.

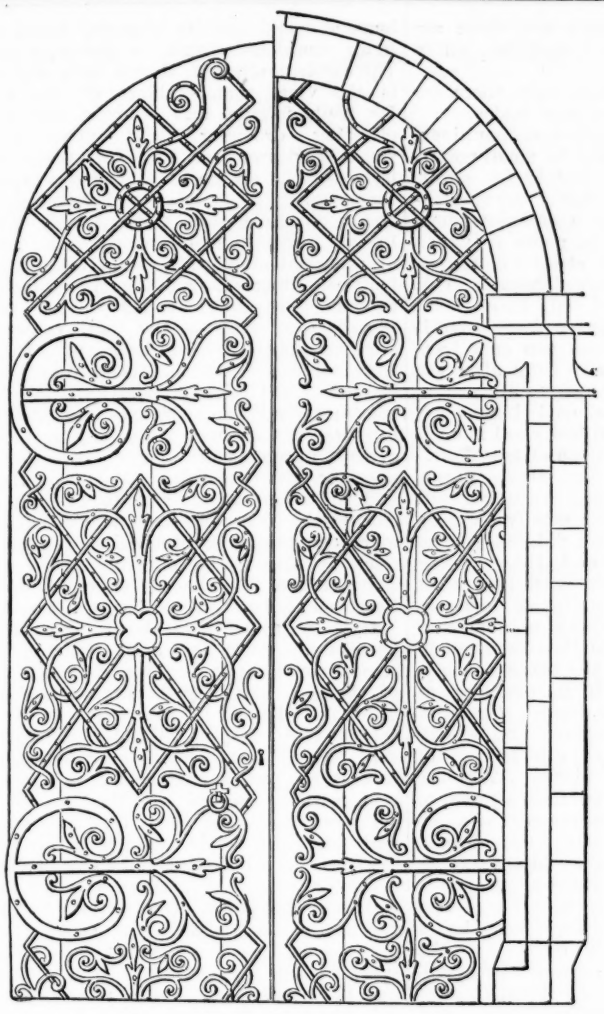
The exhibition contains a considerable proportion of fine and interesting landscapes, the finest of all being a sea-piece (if that is not a Hibernianism) by Mr. H. Moore, "Shine and Shower" (200), an expanse of sea with the waves weltering here dark, there light, under mingled cloud and sunshine; one of the most successful things this painter has ever done. His picture in the First Gallery, "As When the Sun doth Light a Storm" (50) appears at first rather too bold a dashing about of pigments; it must be looked at from a reasonable distance, when it will be recognised as a very powerful representation of flashing sunlight on breaking waves. Mr. Hook's principal work, "Wreckage from the Fruiter" (249) is remarkable for the headlong tumble forward of the mass of wave in the centre; a special colour effect is imparted by the quantity of floating oranges from the wreck. His quieter work, "The Seaweed Raker" (19) is a fine example of his painting of coast scenes in calm weather. Mr. Brett's only contribution, "The Lion, the Lizard, and the Stags" (417), is rather too much of a repetition of some previous pictures from the same neighbourhood; equal to its predecessors, however. Sir John Millais's "Murthly Water" (74) is a rather hard and realistic landscape, certainly not equal to "Murthly Moss" of last year; his other work, "The Old Garden" (242), a view in a garden with thick square-cut yew hedges and a fountain in the foreground, with a bit of distant hill seen over the foliage, is a rich and beautiful work, only requiring (as *Punch* in his peculiar way has hinted) a little more finish and making out of the texture of the hedge. Among landscapes which combine truth to nature with a touch of poetic sentiment, Mr. Adrian Stokes's beautiful work "The Harbour Bar" (756) is pre-eminent: this is a twilight scene looking down the narrow channel through the bar, with the poles stuck up to mark the passage at high tide, out to the sea, to which a troop of fishing-boats with dark sails and their lights just beginning to show in the dusk, are stealing silently out. There is a repose, with a touch of melancholy in this scene, which is beautifully conveyed, and which stamps the author as a poet in his art and in his appreciation of nature. The same praise may be given (in a degree) to a very unobtrusive work by Mr. Arthur Lemon, "The Close of the Day" (333), a work showing very close and sympathetic observation of nature. Mr. Macwhirter gives a fine painting on a large scale of "Constantinople and the Golden Horn" (457), notable for the effect of the clear blue water in the light sunshine. Of Mr. David Murray's contributions by far the finest is "The Moat Farm" (691), about the best thing he has ever done; it glitters with real sunlight, and the distant bit of landscape seen between the two buildings is wonderfully true and real in effect. Among landscapes which produce their effect simply by careful and loving reproduction of everyday scenes and everday effects, a beautiful example is that by Mr. C. E. Johnson, "An Autumn Idyll" (584), a glade in a quiet English country with masses of trees just reddening into autumnal tints, a shallow pool in the centre, a pathway winding up on the right and disappearing among the trees, which tempts the spectator to wander up it in fancy. Mr. Peter Graham's wild coast scene (602) would seem a very powerful though rather stagey landscape, if we had not seen so many like it; but this eternally repeated trick of effect is absolutely wearying. Mr. Leader's "Dawn of an Autumn Day" (662) is intended as a magical effect of sunlight, but somehow it does not compel belief, it is too smoothed out and steely in surface. His best bit of painting is the sand-hill foreground in "Cambria's Coast" (480), but the sea is really too bad. Mr. Farquharson's "Day's Dying Glow" (717) is a good snow landscape. Among others that should be looked at are Mr. Peppercorn's "In the Meadows" (1775), Mr. Kenneth Mackenzie's "Playground of the Sea" (1222), *i.e.*, the neutral ground between high and low water, seen when the tide is out; the same painter's "On the Shores of Kintyre" (1244) which is still better; and Mr. F. S. Richardson's "Out in the West when the Sun is Low" (1250). On the whole, landscape includes a good deal that is of interest this year, though we sadly miss Mr. Alfred Hunt.

Of the sculpture we will say something on another occasion.

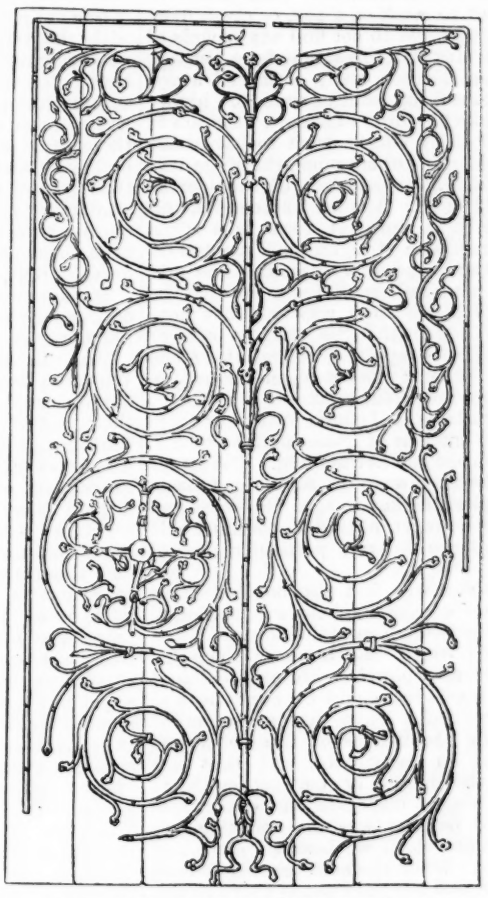


Wrought-Iron Hinges, &c., St. Mary's, Norwich. (*See next page*).

New University at Chicago.—A new university will shortly be opened at Chicago, with funds supplied by the Baptismal Unions of the United States. The University of Chicago's building, now closed, a handsome structure on the southern side of the town, has been acquired, and plans are in preparation for enlarging and repairing it.



Doors to Cloister, Durham Cathedral.



Door of Chapter-house, York Cathedral.

ECCLESIASTICAL WROUGHT-IRON DOOR FURNITURE.*

As so often happens, when you have unlimited time to prepare a subject, you put it off, and the time comes round at last and finds you unprepared. I knew that I had an engagement to be here in May, and my idea of May was the summer time, and that seemed so far off that only on Tuesday I realised that May was this week. This has necessitated cutting the subject in two, but it is so vast that the half of it is ample, and if next session you care to hear the sequel I shall, I hope, be in a position to do it justice. Under these circumstances, I feel free to go back to the threshold of the subject, and it is absolutely necessary from this aspect to begin with the Romans. The reason for this will be apparent.

We have a very full knowledge of what Roman blacksmiths could do, owing chiefly to the destruction of Pompeii and Herculaneum. I need hardly remind you that the catastrophe was almost as unexpected as if the crest of Box Hill were to be suddenly blown up and to bury Dorking. It was so sudden that all the ironwork that was ever in these towns was probably buried with them, and we see exactly what stage their locksmiths and blacksmiths had reached.

We see that they had little love for the art of smithing, and used bronze for art work, and iron only when they wanted its particular quality of strength. There are, however, some hinges and door furniture preserved, and these I look on as of the greatest possible interest and importance. There is a foretaste about them of our Early English hinge-work, whether because they are genetically connected, or whether simply because the method of work of the smith leads to like results when like conditions of requirements are given him, I cannot say; but, looking at the curious fact of the resemblance of these hinges in so remote a country town towards the south of Italy, and their early date,—A.D. 79,—it is impossible to doubt that more to the north, as in Gaul, where the working of iron was carried to a far higher pitch, and at a later date, works which might well have been the progenitors of our own may have been produced. Barbarian ornament and art fled, of course, at the contact of the Classic art of Rome, but it may have left a smack behind. There is ample proof that the Gauls, and probably therefore the Britons, knew how to weld, chase, emboss, tin, gild, and enamel iron. The discoveries at Bibracte, Alise, Bourges, and the writings of Roman authors, prove this.

A point even more important to us is that the ironwork of Gaul extended over central Europe, and to their neighbours the Franks and Goths, because I want to show that these arts were preserved by the Goths of Denmark and Scandinavia during their isolation, whilst the rest of Europe was in the conflagration attending the break-up of the Roman Empire. The metal-work of Denmark, in fact, is in most respects the same as that of Gaul, but modified on the one hand by an influx of Roman currency in exchange for amber, and on the other by the blackest and most heathenish superstition that ever afflicted any land, perhaps, in any age. All the arts of Gaul (such as damascening and inlaying), except enamelling, were preserved, and in particular that of making most excellent chain-mail armour.

It is now necessary to get on to England. The Britons were Christians practising the civilisation of Rome, with walled cities, and villas, and a large iron industry. The conquering Jutes, Angles, and Saxons were pagans, and, probably, not particularly distinguished for any love of the arts, except of war. This in the first conquests was extermination to the people, but the buildings and fittings must in many cases have been spared, and when arts were revived these remained as models. As soon as the conquests of the Anglo-Saxons began to be consolidated, St. Augustine and other missionaries arrived from Rome, and converted them to Christianity, with the result, of course, that churches were required. Now, it is perfectly certain that these churches would be on the Roman models, just as when English missionaries go to heathendom now their churches are built on Anglican models; besides, as we have seen, a large number of Roman buildings must have been at hand to copy from.

We have thus a ground-work of Roman art, probably tinged with Greek influence, when Greek missionaries arrived from Byzantium and became English bishops, as in the case of Theodore of Tarsus.

This was the state of things early in the seventh century, when the missions and learning of the Irish, who established themselves in North Britain at about the same period, began to tell. By the date of St. Cuthbert, late in the seventh century, the Romans and Irish were working amicably, and in process of fusion. The Irish, as you know, were devoted to art, and had developed a most beautiful, if peculiar, mannerism, all their ornament that was not geometric consisting of animals and birds drawn out into such intricate arabesques that their identity is all but lost.

It is plain that this fusion most powerfully influenced the Anglo-Saxon art.

Late in the ninth century a further and still more important arrival came to build up English art. The Danish Goths, who had treasured and developed the arts of Gaul, began to settle in England, and to fuse with the Anglo-Saxons. These people must, according to their sagas, have been the most expert smiths the world has ever seen, even royal princes not disdaining to become blacksmiths. They regarded their swords as imbued with life, and gave them affectionate names, which have been handed down with their own. Who does not remember Wayland with the sword Mimung, which was so wonderfully tempered that it clove a rival smith, who had spent a whole year in making a suit of invulnerable armour, in two, armour and all, and with so little effort that it was only when the rival was asked to get up and shake himself that he was aware he was in two halves, and, consequently, as good as a dead man?

It was not likely that the Saxons, who at once appropriated the terrible Danish axe, would not have availed themselves of such smiths as these, and we thus have the yeast out of which Early English art was fermented.

Nor was it likely to be long before such warrior races, skilled in working iron, discovered its use in protecting doors. When we consider that for several centuries their church doors might at almost any moment be thundered at by robber hordes, bent on slaughter and pillage, the overwhelming importance of such protection will be understood.

* A paper by Mr. J. Starkie Gardner, read before the Architectural Association on the 3rd inst., as elsewhere mentioned.

The hinge was, of course, the first point to attend to.

The simplest form of hinge would be a strap of iron bent at one end at a right-angle to clasp the thickness of the door, and then curled to form a socket to work on a peg, or pivot, fixed to the jamb. But we do not find any records of early English hinges of this simple form, perhaps because it could be too easily wrenched away, perhaps because the smiths were too highly skilled to make anything so simple. Certain it is that their early efforts seem to have been devoted to clamping or cramping the hinge, like an eagle's talon, over as much of the door as they possibly could. The most successful, and therefore the most prevalent, form, is a triple strap, the centre one straight, and the lateral curved like the horns of a crescent. The *tria juncta* may have had something to do with the favour in which this form was held, but more likely it was the fact that the starting point or junction of these straps was behind the stone rebate when the door was closed, and, therefore, no pirates could force them off.

As this form was in fashion for two or three centuries, the number of guises under which it appears are somewhat bewildering. The straps terminate almost always in scrolls or foliage, and this supplies the key to age. Rudeness and plainness are, however, no index, nor am I able just now to trace out any particular lines of descent.

Sometimes you will find disconnected straps and bands and ornaments between the hinges, and these often deserve careful study.

It is quite obvious that, however much you might spread and clutch with the external hinges, the woodwork could be burst in, and there is very little doubt that a system of armour-plating the insides of the doors was introduced at an early date, and that this plating, in the hands of our accomplished smiths, took a very elaborate and ornamental character, and perhaps was the veritable *opus anglicum* about which we hear so much and know so little. When the need for this defence was forgotten, and the rude Saxon doorway was replaced by the moulded Norman doorway, or the wood decayed, this decorative system of interior plating was abandoned, and it was more or less bodily, according to circumstances, transferred to the outside, where it looked decorative. On no other hypothesis can we explain the odd state of things on the celebrated Willincale doors. Here are two splendidly early crescent hinges with some particularly beautiful straps, arranged, as a child might place them, in inverted pyramids,—no doubt the work of some Mediæval patcher and joiner.

But the Durham hinges * (see illustration) present us with a far finer example. Here you have the crescent or horseshoe hinge, belonging to the outside of the door, developed into most beautiful scrolly ends, with an intersecting lozenge and scroll pattern of much more delicate work fitted between them. Now it does not need much scrutiny to see that the lozenge diaper has been cut across to make it come in between the hinges, and that it was never likely to have been designed for any such position. The design, though very efficient as an armour-plating inside, would be useless as a protection outside, for the pieces are all separate, and merely tacked against each other, and not welded into one.

The design is as unlike Classic as anything can be, reminding one of Irish carving, like that at Clonmacnois, and evidently produced under the Lindisfarne and St. Cuthbert influence. The doorway is of the year 1135. The style of the hinge has been repeated in France, and is there ascribed to early twelfth century. What the date of the ironwork may be I must leave you to decide. Canon Greenwell, who is a great authority, calls it late twelfth century.

Another example of this armour-plating is the well-known one of Hormead. This is not so early, and has perhaps less of the Celtic element, and a good deal of the Danish. The birds are unmistakable; there is something at the top derived from a dragon, and the little curls are quite characteristically Danish. It is in a Norman doorway, and has been called fourteenth century, but it cannot, I should say, be later than the twelfth. Another one is at Skipwith,—a design based on circles; and there are many others existing, which I shall be glad to learn something about.

To go back to our horseshoe form, there are two further developments we must notice.

One is the Lincoln Cathedral west door hinge, with the three straps ending in small points, and decorated with small C and half-C scrolls backing on to the straps; it has a very twelfth-century look: and the other a crescent hinge without the central strap, in place of which there is a wholly-detached strap foliated at both ends, and generally rather elaborate. This type is rare in England,—I only know it at Canterbury and one or two other places,—but is quite common in France, and can only have been developed from the earlier form after the need for defence had passed away.

Some really horse-shoe shaped hinges are occasionally used which seem fashioned in compliment to St. Martin, the patron of travellers.

We will now consider the Danish type. When the Danes were converted it was in a half-hearted way, and they never wholly gave up their superstition as the Saxon did, but grafted Christianity on to Wodin and Thor. Their hingework can always be detected, because it introduces emblems in a lavish manner. A good many exist in Denmark, of course of a relatively later date, since Christianity only began to prevail there in the tenth century, and these are most valuable in enabling us to recognise and track the Danish characteristics here. Few exist in England, and we will only allude to two. They are formed of numerous small detached pieces. That at Staplehurst has been removed from a round to a pointed doorway, and the present arrangement is probably quite different to the original. It still comprises a Viking's ship, fishes, a goose, sea dragon, snakes, crosses, part of a knotted pattern, and a horseshoe hinge and straps. The Stillingfleet example also has a ship, two men, and a reminiscence of the triskele, as well as a strap like a knotted cord, which is very usual in Danish work, and not elsewhere—all probably of profound import and tending in the direction of propitiating the evil one.

This Danish influence gradally merges, and is at last only traceable in thirteenth-century hinges in a dragon or some other uncanny beast poked away where it can't be readily discerned.

The fable that the skins of sacrilegious Danes were stretched on church doors shows their connexion with the hinge-work, and is due to the custom of lining them with scarlet skins to set off the iron, which was commonly gilt or tinned.

We now deal with the more distinctly classic type of hinge.

This we may take as consisting of essentially a central stem branching into scrolls, often mingled with foliage. The oldest in type of design, if not themselves so very old, are those at St. Albans. These remind one more than any others of the hinges shown in the Cædmon MS. in the Bodleian, acknowledged to be late tenth-century. They each consist of six very much convoluted scrolls springing from a main stem, with cross-hatched surface, and introducing in each case a little foliage. Of course, in the case of an inland town, the need for defence would be less pressing, and they may have ventured a form here that they would not in more exposed places. The type is, anyhow, excessively rare at an early date, but it gave rise to several others, notably the strap which runs straight out for a good distance, and then suddenly branches into a tuft of leaves and scrolls, like a pollard. This was a favourite in France, though derived from England, as the Cædmon and Cotton MSS. show. The stem is often reeded as if formed of a sheaf of stems bound together.

The door to the crypt at Wells shows a perfectly unique development of the scrolly hinge from a central stem, which looks as if an English design had been entrusted to Danish hands. Anyhow, there are innumerable clusters of perching birds, which look like guillemots introduced in a floral manner. This work is certainly not now *in situ*, and must have been removed when in disrepair from an outer door.

Towards the twelfth century all these various elements had crystallised, or congealed, as it were, into a definite style, which we may call *par excellence* the Early English. The need for defence had passed away, but not the traditions which it gave rise to. The Celtic and the Classic have fused and produced a rich system of easy-flowing yet elaborated foliated scroll-work, while the Danish has only imparted excellence of work, and its lingering traces survive in an occasional dragon or grotesque monster. The emblem selected, almost with one accord, is the vine, that emblem of the Church. Its fruit, foliage, and tendrils, and trailing, climbing, drooping habit, fitted it in a supreme degree for its high place as the basis for the design of all the door coverings for nearly a couple of centuries. The treatment is highly conventional, the leaf having become evolutionised into either a symmetrical or a symmetrical trefoil, and the fruit being more like a crude representation of a fir-cone. The plant had already become conventionalised as early as the tenth century, but does not seem to have been applied to iron-work before the twelfth. Its origin is Roman or Byzantine, but it does not lend itself to defensive treatment, but to decorative only, and, therefore, its use for doors could only have become general in ages when danger had passed. It seems to have been fairly spread over England, and thence found its way to France; but it clusters chiefly in the eastern counties, and seems more common in Bedfordshire than anywhere else. It takes on the scroll and horseshoe form, some of the best known examples being at Leighton Buzzard, Eton Bray, Uffington, St. Mary's, Norwich * (see illustration); but the loveliest, because the most unfettered and slender treatments, are found on the insides of doors. The magnificent example in St. George's Chapel is arranged in a large vesica-like diaper; Chester Cathedral is very rich; York, where the whole plant is represented growing from the root, which is very prettily treated to the top, where it overflows and falls down (see illustration)—with the little Danish dragon tucked away at the top. Now I shall introduce you to two remarkable cope-chests, because I want to illustrate a special point. One, you see, is the conventional vine; what is the other? One is all curves, softly flowing; the other is spiky, jerky. It suggests to me that if one is borrowed from the vine, as we know it is, the other is equally taken from the corn, and what would be more natural, if a foil were required, than to illustrate the second element of the Sacrament? We have the same foil in several cases, such as Sens, but most notably in the grand example of hingework I shall now introduce—namely, the Eleanor grille—for, though a grille, it is really composed of hinge work laid upon a frame of iron instead of wood. Here you see the majority of panels taken from the vine, with here and there one of wholly different growth, a reminiscence of the stiffer corn, and in the midst of all the little animal's heads—perhaps a legacy of the Dane.

This application of hingework was evidently a success, for we find that the Abbey of St. Denis was not to be outdone, and ordered a similar one in which the same dies appear to have been used.

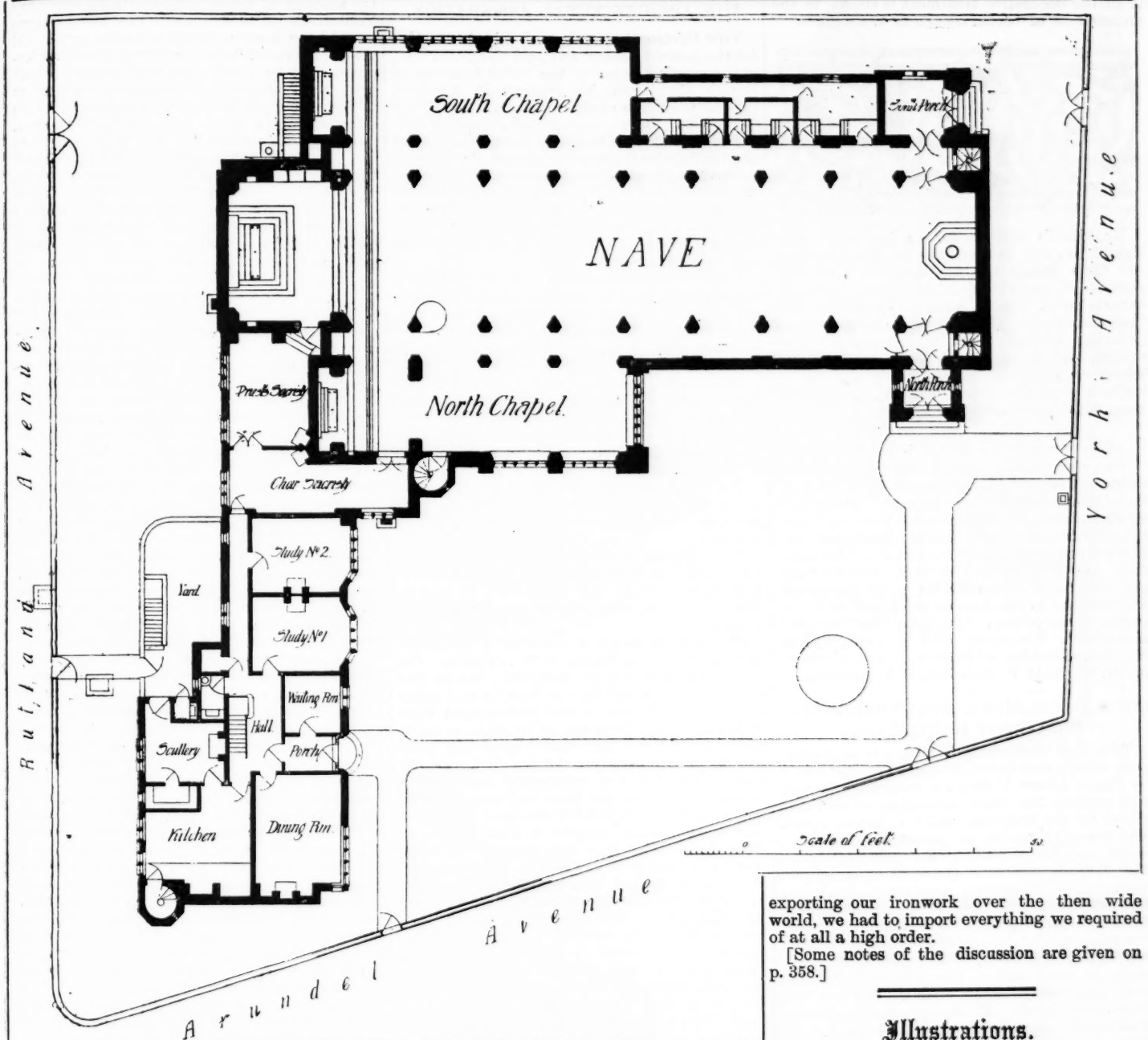
The latest large works of this character are the hinges to Merton College, late thirteenth century, of the horseshoe form, very floridly treated. Up to this date the vine and the corn are the only plants admitted, with a solitary exception at Worksop, in which we have a most beautiful treatment of the lily. This, with the thistle and passion-flower, nearly ousted the vine in the fifteenth century.

Now we must pass to Paris. You must have been struck, or perhaps I forgot to point it out, with the fact that all our types of Early English ironwork have their counterparts in France. Every kind of hinge that we have seen, except the very earliest, have, if not their exact counterpart, at least replicas by the same hands, and it is the same with every grille. There is no difference between English and French work, and, I believe, we might even say English and German and Spanish, down to the fifteenth century. Now, we are perfectly certain regarding our own works that they are by Englishmen, for in the cases of the Eleanor grille and the Henry V. Chantry, we know the men's names and the prices they were paid. These two works,—and, indeed, all the others,—are very peculiar. How did they get to France? Did an architect supply details, did the French smith come over to copy, and did our English smiths lend their stamps or matrices for the leaves and flowers? Or were they simply made in England and exported?

The latter, I maintain. The Cædmon MS.

* For the illustration of the ironwork on this door, as well as of that on the door of the Chapter-house of York, we are indebted to the courtesy of the Editor of the *Journal of the Society of Arts*, wherein they appeared (with others) on Feb. 25, 1887, in illustration of a paper read by Mr. Starkie Gardner before the Applied Art Section of that Society.

* By the kindness of Mr. Starkie Gardner, we are enabled to give the accompanying illustration of the hinges, &c., at St. Mary's, Norwich.



St. Clare's (R.C.) Church, Sefton Park, Liverpool.—Plan.

shows that English smithing was already of a high order half a century before the Conquest. When the Conquest came, Norman craftsmen supplanted the English, and the English names of mason, carpenter, joiner, tailor, have been lost, but not so with the smith. The English smith held his own, and it was the French smith, the mere farrier, who played the completely subordinate rôle of shoeing horses. What could show more completely the superiority of the English artist-smith than this delegation of the mechanical branch only to the smiths of the conquerors?

The French never were smiths in Mediæval times; they have lost their own term, "*ferrier*," which we have preserved, while their present word, "*forgeron*," is modern.

Now we can approach our last picture, the grand hinges of Notre Dame,—the most colossal in the world, each of the hinges being large enough to cover an ordinary church door.

They represent the terrestrial paradise, and whether for richness or execution, represent the *ne plus ultra* of such work. They are the most surprising piece of metal work of antiquity. They adorn the principal portals of the central church of the capital of France, and yet not the faintest tradition exists concerning them. The French, who began to treasure the names of their artists since the days of St. Eloi, can do nothing more than ascribe them to the devil,—and why? Because they were made in England,—because they were dropped down suddenly complete. They do not fit, and are not likely to have been made on the spot. Those who bought them cared not to insist and impress on the public mind that they were made in a foreign country,—especially England, which had already developed hostile rivalry. This oblivion always follows the import and export of any great work, the nine days' wonder is forgotten where it is born,—out of sight out of mind,—and the mere episode of its arrival is not long remembered in its new home. The same thing is seen everywhere. Look at the magnificent iron screen of St. George's Chapel. What do we know about it? Nothing. Because it came ready-made from Flanders.

Time is now up. No doubt I have left off just where you would have expected me to have begun. I hope I have proved, however, that English art, built up as Greek art was, from the accident that it was the meeting-place of many styles,—was in metal-work a real and living one. It came to perfection in those manly days when our ancestors were winning our parliamentary freedom. It was an art untrammelled, in which the smith was as free to devise his subject as the artist is to devise his picture. The forms evolved are, therefore, essentially forms characteristic of iron beaten while soft and yielding,—utterly unlike those of the contemporary wood and stone. No file nor drill nor saw nor lathe was used, but only the hammer, the anvil, and the punch.

When the smith's wings were clipped, his art failed. Some wave of fashion,—the Crusades, or opening trade with the East,—brought a taste for Oriental design. The choir gates at Canterbury are Saracenic. The Henry V. Chantry grille is Saracenic, with Italian modifications. Very many of our church door-handles are absolutely Moorish. This chopped and stilted treatment of iron which he had no part in inventing, the smith could take no interest in. This imposition of foreign design, unfit for the material, caused smithing to wane and gradually die out so completely, that two centuries later, instead of exporting our ironwork over the then wide world, we had to import everything we required of at all a high order.

[Some notes of the discussion are given on p. 358.]

Illustrations.

ST. CLARE'S (R.C.) CHURCH, SEFTON PARK, LIVERPOOL: EXTERIOR.

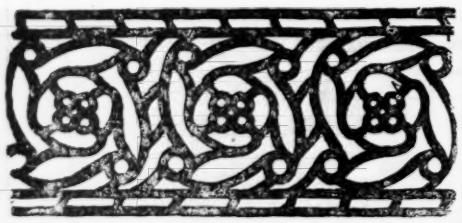
THIS church is being erected at the corner of Arundel and York Avenues, Sefton Park. The presbytery, however, is not being built at present. The materials used are local bricks, with Storeton stone dressings. The church will hold about 600 people, and is the gift of two Liverpool gentlemen, Messrs. Frank and James Reynolds. An interior view was published in this paper on May 3rd, and the drawing of which our illustration is a reproduction now hangs in the Architectural Room at the Royal Academy. Mr. Leonard Stokes, of London, is the architect, and the builders are Messrs. Morrison & Sons, of Wavertree, Liverpool.

DESIGNS FOR STAINED GLASS WINDOWS.

THESE window designs are reproduced from cartoons by Mr. C. W. Whall which were at the Arts and Crafts Exhibition last autumn, when we remarked upon their merits, especially that entitled "Water," both in regard to the original inventive fancy shown in them, and their suitability for execution in stained glass. The figures are from an uncompleted series of pencil designs illustrating the "Te Deum," being two figures from a design of the "Four Elements," illustrating the verse "All the Earth doth worship Thee."

The treatment of the heads of the windows illustrates a fancy of the designer for producing decorative effect and expression in the leading; in the original cartoons the glass was shown entirely white here, but Mr. Whall has introduced a slight difference in tone for this illustration, in preference to the plain white glass.

A similar decorative treatment is shown in the annexed bit of border design in white glass.



Mr. Whall's exhibits at the Arts and Crafts Exhibition, and subsequently at the Liverpool Art Club during the Art Congress last year, showed a great variety of work, partially experimental, but all marked by ability and inventive power. He has now determined on devoting himself specially to stained-glass design, and if he can produce work like this which we illustrate (unfortunately and necessarily without the colour element), he ought to meet with opportunity and success.

VILLAGE CLUB HOUSE, HARTEST.

THE club house illustrated herewith has been built for the use of the villagers of Hartest, in Suffolk. It consists of one large hall, about 45 ft. by 22 ft., with a kitchen and offices and caretaker's room attached. A swing-hatch from the kitchen communicates with the hall. The materials are red brick, tile-roofs, weather-tiles, and rough-cast coloured with ochre lime wash. The framing to the dormers is of oak, with oak panels in the gables. The total cost has been about 800*l*. The works have been executed by Mr. Cadge, builder, of Hartest, from the designs of Mr. Reginald T. Blomfield, M.A., architect.

COUNCIL CHAMBER, MUNICIPAL BUILDINGS, WEST HARTLEPOOL.

THE New Municipal Buildings, West Hartlepool, which were formally opened on the May 1 by Prince Albert Victor, are centrally situated, and provide the usual municipal offices, also offices for the Guardians and the School Board. The Council Chamber is placed on the second story, and extends along the principal front. The Mayor's parlour is arranged *en suite*, and corresponds in general treatment with the Council Chamber. The building has been designed with regard to future extension. The materials used for the exterior are small, dark red bricks, with bases, cornices, and other dressings of terra-cotta. The roofs are covered with strawberry-coloured tiles. The cost has been about 7,000*l*. Mr. Joseph Howe, of West Hartlepool, was the contractor, and Mr. R. Knill Freeman, of Bolton and Manchester, the architect.

STABLES, HAWKSHILL, LEEDS.

THESE buildings, now in course of erection, are of brickwork, with half-timbered and cemented work to the upper portions, and with red-tiled roofs. The accommodation comprises coachman's house, stable with two loose boxes and two stalls, harness-room, piggeries, and cow-house. The architects are Messrs. Chorley and Connon, Leeds; the builders being—for brickwork, &c., Mr. George Burnel; for joiner's work, Messrs. Tomlinson & Son; for tiling, Messrs. Watson & Worsnop; for plumbing, &c., Mr. I. E. Bedford, all of Leeds.

RADBORNE CHURCH, NEAR DERBY.

THE drawing of this church, now hung in the Architectural Room at the Royal Academy, shows the appearance it presents since its restoration at the cost of the squire, Mr. Reginald Chandos-Pole. The work comprised a new chancel-roof, east window, screen, reredos, choir stalls, &c.; a new organ chamber; new flooring to the nave, and re-seating the same; stripping walls of plaster and pointing, &c. The whole of the woodwork is done in oak. In every respect the restoration has been a thoroughly conservative one, not a single stone of the original fabric having been disturbed unnecessarily. The east window has been filled with glass by Messrs. Heaton, Butler, & Bayne. A new organ, by Messrs. Conacher & Co., of Huddersfield, has been placed in the church at the cost of the rector, the Rev. William Chandos-Pole. The whole of the work has been carried out by Messrs. Tomlinson & Sons, of Leeds, under the direction of the architects, Messrs. Chorley & Connon, Leeds.

THE ARCHITECTURAL ASSOCIATION.

THE thirteenth meeting of this Association for the present session was held on the 3rd inst., in the meeting room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (President) in the chair.

Mr. W. H. Barker was elected a member.

Mr. T. E. Pryce (Hon. Sec.) read the list of nominations for the new Committee, Mr. Leonard Stokes being nominated as President, and Messrs. W. Burrell and T. E. Pryce as Vice-Presidents. He also stated that Mr. Henry Lovegrove had been nominated as President, his paper being signed by Messrs. C. G. Baker, J. H. Richardson, and Frank Massey.

Votes of thanks were passed to Mr. J. Starkie Gardner and Mr. Clement Heaton for allowing the members to visit their works, and to Messrs. Goldie, Child, & Goldie, for permitting the members to inspect the new church in Spanish-place.

The annual dinner of the Association was announced to be held at the Holborn Restaurant on June 5. The ladies' concert of the "A.A." Lyric Club, it was also announced, would take place on Thursday, 23rd inst., in the Galleries of the Institute.

The Chairman drew attention to a collection of the late Mr. George Devey's sketches, which had been presented to the Association by his executors.

Mr. J. Starkie Gardner then read a paper on "Wrought Iron Door Furniture (Ecclesiastical)." This paper, which was illustrated by lantern views, we print, with some of the illustrations, on another page.

Mr. Leonard Stokes, at the close of the paper, proposed a vote of thanks to Mr. Gardner. The lecture was rather more historical than he had anticipated it would be,—in fact, he had rather thought Mr. Gardner would have treated more of modern door furniture, as he knew so much about the subject, and would have told them how to design a modern hinge. It had never struck him that the ornamental ironwork to be seen on so many old doors had been intended primarily for strengthening the door, but rather that, people being obliged to have hinges on their doors, they had endeavoured to make them as ornamental as possible. One interesting point which had been raised was the question of having the hinges inside instead of outside the door. Now-a-days the hinges were put on the outside because, he supposed, they showed more; while in the olden times the inside position was perhaps considered to be the more important, as strengthening the door. He differed from Mr. Gardner on that point; the right place to strengthen the door being, to his mind, on the outside.

Mr. R. Langton Cole seconded the vote of thanks, and said that the lecturer had demolished one cherished dream of his early youth, viz., as to the Danish skins. There was a celebrated door at Dartmouth, which had lions or leopards upon it, like those mentioned by Mr. Gardner, and he always understood that the skins upon such doors were those of real Danes. The first Danish door which had been exhibited on the screen showed a distinct arcading, suggesting a Norman, with perhaps a somewhat Saxon balustrade treatment of pillars supporting it, and he would like to know whence it came. As to the beginning of the vine pattern, he understood Mr. Gardner first to say that it occurred in the tenth century, and afterwards that it did not belong to anything earlier than the twelfth century. He would like to know exactly what Mr. Gardner had meant by that?

Mr. F. T. Baggallay considered it was exceedingly useful to the members that gentlemen like Mr. Gardner should come and tell them how to design those things, and what points they had to consider in making their designs, so that they might be carried out by practical men. The strong resemblance between French and English ironwork had never struck him before; but he had observed how very different the treatment of the German ironwork was to anything he had seen elsewhere, most of it being also of a very high character. The most interesting things in German churches were the iron and wood work, and he hoped in any future sequel to the lecture, Mr. Gardner would tell them something about the German ironwork.

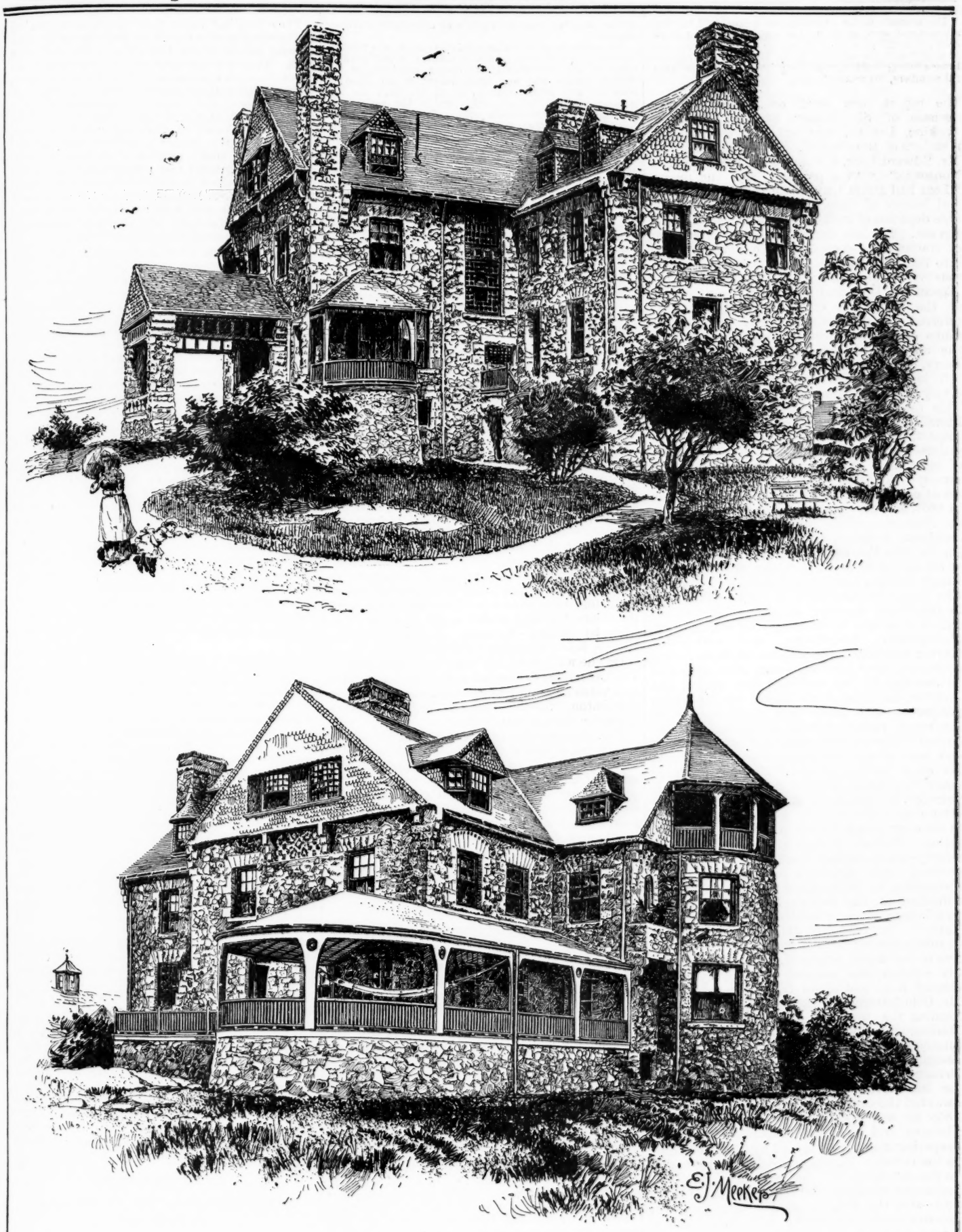
The vote of thanks was then put, and carried by acclamation.

Mr. Gardner, in replying, said he would as soon have given a paper on the practical branch of the subject, but the members were welcome to see it at his works whenever they chose. In the absence of forges, and everything necessary to illustrate it, he was afraid that the members would have found it rather a barren topic. Of course, he could have conveyed a general impression as to what work was expensive and what was inexpensive, but a few minutes at a forge would put them in possession of all that knowledge in a much more complete manner. The practical part of the old hinge work was that it was entirely made with the hammer and anvil, no screw-drivers, drilling-machines, saws, or files being used in its production. It was simply knocked off the anvil with the hammer. The later hinge work, and especially that of Germany, was a mixture of the hammer work, and of file and saw pierced work; in fact it was the work of the locksmith. It was very beautiful, but was altogether different from the old work. It had quite a different spirit and sentiment, the one being simply decorative, while the other, as he had endeavoured to show, was intended for defence. In no other way could they understand the forms of great strength which were so widely spread. With regard to Mr. Cole's remark as to the Dartmouth door, the hinges with lions or leopards were undoubtedly as late as the seventeenth century. They were very curious, because they were of a date when there was hardly any smithing at all in England; it was then the dark age, before the dawn,—the dawn being the reign of Charles II., who at the Restoration introduced French manners and customs, and with them a love for ironwork. The French revival of ironwork preceded the English revival by some thirty or forty years, the latter taking place only in the reign of Charles II. The Dartmouth hinge, like many others, was the result of a sort of spasmodic effort all over the country, being distinguished by a spirit of exuberant loyalty showing itself in oak-leaves, crowns, lions, or something which denoted the feeling of the time. As to the Danish skins, it was well known that these were skins of animals; they had often been tested, and the whole idea of their being human skins was a mere myth. With respect to the vine-pattern, he had said it appeared in MSS. of the tenth century. In the Caedmon MS. it appeared in the shape of sculpture, and wall decoration, but it was not applied to ironwork until the twelfth century, because ironwork was required to be sturdy, he imagined, and a weak form was not available. He was simply tracing the origin of the ornament in its application to smith's work. In conclusion he hoped to be able to continue the subject on some future occasion (applause).

A cordial vote of thanks was passed to the gentlemen who had so ably contributed to the amusement of the members at the recent *soirée* of the Association, as reported in our last issue.

Birmingham Architectural Association. A well-attended meeting of this Association was held on Tuesday evening last, when a paper entitled "The Cross in Art" was read by Mr. J. W. Tonks, who described the origin and development of the various forms of the cross, and urged that its great use, whether as the jewelled ornament of a lady or to regulate the plan of a cathedral, was due largely to its symbolism of the Christian faith. In speaking of the many forms which the cross has assumed, Mr. Tonks described its evolution from the plain equal-armed cross called the cross of Constantine, and showed the development of the Passion cross and its varied elaborations keeping pace with the growth of realism by which the crucifix supplanted the plain symbolical cross. Mr. Tonks instanced the crosses of SS. George, Andrew, and Patrick in the Union Jack and the many forms of cross used by the Crusaders as representative of the various forms adopted, and showed an impression of the seal of Rochester, in which Christ is shown as suffering crucifixion on a X-shaped cross, as an early example in which the symbolism had not given place to the realism of a later date. At the close of the paper, which was illustrated by a number of interesting drawings, a very hearty vote of thanks was, on the motion of Mr. T. Naden (president), supported by Messrs. Doubleday, Cotton, and others, unanimously accorded to Mr. Tonks for his able paper.

Design for Friars' School, Bangor.—In the plans of the design by Messrs. Oliver & Leeson, given on p. 318 *ante*, the scale was figured wrong; the divisions marked as 10 feet should represent 20 feet. The mistake was that of our draughtsman.



House at Cohasset, Massachusetts.

HOUSE AT COHASSET, MASSACHUSETTS.

THIS is a house built from the designs of Mr. R. W. Emerson, of Boston. It is built of random stone-work, at a cost of 25,000 dollars. Two views of it are given.

Examinations at the Surveyors' Institution.—Too late for insertion this week we have received from the Secretary the results of the recent examinations for the Professional Associateship. The list shall appear in our next.

THE ART-UNION OF LONDON:

ANNUAL MEETING AND PRIZE DISTRIBUTION.

THE annual meeting of the Art-Union of London was held on Tuesday last, in the Adelphi Theatre (lent for the occasion by Messrs. A. & S. Gatti). Mr. James Hopgood, Member of Council, occupied the chair, in the absence of the President, the Earl of Derby. The annual report, read by Mr. Hallett, said:—

"The promised improvement in the general state of business not having yet reached the circle of our subscribers, the Council have to report that the subscriptions for the present year amount to 5,338*l.* 4*s.*, being less than they had hoped.

The following is a brief summary of the receipts and expenditure; a detailed account will, as usual, be printed in the report.

Amount of subscriptions				£5,338	4 0
Alloted for prizes	£1,285	0	0		
Set apart towards providing works of art for accumulated payments	397	7	0		
For print of the year, exhibition, report, and reserve	1,081	4	2		
				2,763	11 2
Agents' commission and charges, advertisements, printing, postage, rent, &c.				2,574	12 10
				£5,338	4 0

To the local honorary secretaries and agents in all parts of the world we have, as usual, to express the thanks of the Art-Union.

'The amount to be expended on prizes will be thus allotted:—1 work at £100; 1 at £50; 1 at £40; 4 at £30 each; 4 at £25 each; 6 at £20 each; 10 at £15 each; and 12 at £10 each; in addition to 25 'Bellerophon' *repoussé* bronze vases; making, with the prizes given to unsuccessful members, 264 prizes."

The report then went on to mention the decease of Sir Walter Stirling, Bart., of Faskine, Lanark, who was one of the oldest members of the Council. In January last died Mr. Edward Lear, the author of the "Book of Nonsense." "As a painter," says the report, "Lear had a rare sense of the dignified romance and beauty of classic lands, and was a most able depictor of rocks, trees, lakes, clouds, and the sea. The late Earl of Derby, a warm lover of Italian and Greek landscape, sent the youth into Italy and Greece, where he painted numerous views of Albania, Macedonia, and the Ægean." The death of Mr. Frank Holl, at the early age of forty-three, was next referred to as leaving a sad gap in the ranks of our foremost portrait-painters. "In the autumn of 1888 died Mr. T. Gambier Parry, of Highnam Court, who, although generally known as an eminent amateur, has rendered a very real,—indeed an unique,—service to art. This consists not in his contributions to art literature, albeit they are entitled to every respect, but in his invention of the spirit-process of mural painting, whereby the ravages of time, and more especially of damp and atmospheric changes, are, relatively speaking, set at nought. He first published his invention in 1863, and proved its value in his own church, at Highnam, where he acted as his own architect, designer, and stained-glass painter." On the 24th February died Mr. P. H. Delamotte, at the age of 68 years, Professor of Drawing in King's College, London, and a well-known artist, who began to contribute to public exhibitions in the Royal Academy in 1861. He was the author of several books, essays on art, drawing, photography, decorations, and antiquities. Having mentioned the decease of Signor Carlo Pellegrini, the "Ape" of *Vanity Fair*, who died on January 22 last, and also that of Mr. Jas. Swinton, an artist little known by the rising generation, who lately died at the age of 68, the report stated that in September last Mr. Arthur Willmore died, aged 74, "one of the last and best of our line engravers, and who with his elder brother, J. T. Willmore, produced many fine plates for the Art-Union." "Last year Mr. R. Redgrave, R.A., was called away after a short illness. He was born in 1804, and in his early youth he was employed under his father, William Redgrave. At the age of twenty-one he entered the Royal Academy as a student, and supported himself by giving instruction in landscape drawing. In 1836 he exhibited at the British Institution his first well-known work, 'Gulliver on the Farmer's Table.' In 1838 an illustration of one of Crabbe's poems from his hand was hung on the line at the Royal Academy, and from that time his success was assured. In 1851 he was elected R.A., and about that time he assisted Mr. Cole (afterwards Sir Henry Cole, K.C.B.) in forming the museum of ornamental art at Marlborough House, the nucleus of the present museum at South Kensington. In 1855 he was associated with Mr. Cole in representing Great Britain at the Paris Universal Exhibition, and for his services in this connexion he was awarded the Cross of the Legion of Honour. In 1858 he was appointed Surveyor of Crown Pictures, and for many years was engaged in preparing a catalogue of all pictures belonging to the Crown. He continued to send pictures to the Academy till the year 1878. His long connexion with the South Kensington Museum and with the Schools of Art throughout the country made him known to a wide circle of friends who will all feel his loss—and it is in reference to his services in this respect that he will be most fully estimated." The report continued:—

"The Report of the Science and Art Departments lately published testifies to a vast amount of activity and labour. In 1835, when the inquiry into the best means of extending a knowledge of the arts and principles of design among the people was first started in Parliament, the warmest friends of the movement could not have anticipated the dimensions which it has now attained. The whole country is covered with an elaborate network of schools and arrangements for lectures and examinattons, and through this agency nearly a million persons receive some form of art instruction. Round the ordinary machinery for the propagation of a knowledge of arts and sciences are grouped various local or special institutions conducing to the same objects. At the centre of the organization stands the South Kensington Museum, with its branch at Bethnal-green. Beginning with a collection of casts at a cost of 1,300*l.*, it has risen to be the owner of a collection valued at a million sterling, but absolutely priceless. For its kind and purposes no state in the world can boast so exquisite an assortment of artistic treasure.

The public is undoubtedly inquisitive as to the relation between the zeal with which advantage is indisputably taken of the educational advantages provided for the British people and any improvement in its sense of scientific and artistic truths. In all education the important point is the proportion which the assimilated particles bear to the crude mass. Are the scientific intuition and the artistic taste of the nation keeping pace in growth with the expansion of the educational machinery? If there be radical deficiencies, are they of a nature to be corrected by alterations in the working gear? That the appetite of Englishmen for the reception of scientific and artistic ideas has been wonderfully stimulated since the influence of South Kensington made itself felt is allowed. It is not so obvious that the direction of the impulse has been on an equality of merit with the vehemence and extent of the movement. In British art, at all events, the increase of volume is sometimes more conspicuous than the elevation of aim. The awakened instinct of the people still remains greatly incapable of distinguishing between the genuine and the false. At present the public judges boldly, and gives chapter and verse in defence of its views, which as often as not are essentially erroneous as before. The Department is certain to be in possession of abundance of evidences of the success or failure of the educational influences which control or supervise it.

As the practical outcome of our efforts in art-education, we may quote the words of Mr. Swire Smith, one of the Royal Commission on Technical Education. He said that although the Science and Art Department had its defects, yet it was marvellous what it had produced in many towns; for instance, in Birmingham twenty-five years ago there were no English designers and no superior English workmen in any of the great works. Messrs. Elkington employed twenty-five foreigners, and in many other works they had foreign workmen in all the leading positions. At the time, however, when the Commissioners visited Birmingham, such had been the influence of the School of Art that English talent had almost superseded foreign designers and workmen. In 1878, at the International Exhibition in Paris, English glass and English china products were admitted to be among the best, if not the best, of existing artistic works of their kind in Europe."

The report then went on to give a review of the first annual Congress of the National Association for the Advancement of Art, held at Liverpool last winter; and it concluded by announcing that for next year's presentation work the Council have provided a set of eight etchings, by Messrs. Burgess, Holloway, Morris, Ridley, Robertson, and Slocombe.

On the motion of the Chairman, seconded by The Chisholm, the report was adopted, as were also votes of thanks to the hon. sec. (Mr. Zouch Troughton) for his services, and to Messrs. Gatti for the use of the theatre.

The drawing for prizes then took place, the first prize, entitling the holder to select a work of art of the value of 100*l.*, falling to a subscriber (A. Albanezi) at Malta.

[We congratulate the Art Union on having turned their attention towards etchings as presentations, a class of work far more artistic in spirit, and better calculated to cultivate the artistic taste of the recipients, than the large and rather coarse engravings which used to form the staple of the presentations.]

THE LONDON COUNTY COUNCIL.

THE London County Council met on Tuesday last at Guildhall, Lord Rosebery in the chair.

The Money Bill.—The Finance Committee presented a report in which they said that they had considered the Money Bill for 1889. That, as the Council would be aware, was a Bill promoted annually to obtain Parliamentary power to raise the money likely to be required in the ensuing year, for capital purposes in carrying out the various works under their own charge, for contributions towards local improvements, and for loans to other public bodies in the administrative County of London. The total amount of borrowing-power proposed to be taken for works was 1,737,850*l.*, of which 1,043,863*l.* was a re-grant, leaving 693,987*l.* as the amount of new grant. The amount for which borrowing-power was proposed to be taken for loans to public bodies was 1,560,000*l.*, of which 681,500*l.* was a re-grant, leaving 878,500*l.* as the amount of new grant, and the total of the new borrowing-power under the Bill, 1,572,487*l.* The Bill also proposed to remove the limitation of one halfpenny in the pound placed on the amount authorised to be raised for the maintenance of the Fire Brigade, and also to remove doubts as to the power of the Vestries and District Boards to borrow and the Council to lend for the purpose of erecting mortuaries. The Committee having carefully considered and approved of the provisions of the Bill, recommended:—

"That the Money Bill be referred to the Parliamentary Committee."

This was agreed to.

Salary for the Deputy-Chairman.—The Standing Committee presented the following report:—

"1.—Your Committee have to report that they have had under consideration the question of the organisation of the staff of the Council, and, in submitting this report, the first observation they have to make is that their recommendations must be to some extent tentative in their nature.

They have had under their careful consideration the question of who should be the responsible chief salaried officer of the Council and the head of its staff. They are not prepared to recommend the appointment of a permanent official for this purpose. They are led to this conclusion mainly by these two considerations: first, that the appointment of a permanent official would largely put it out of the power of the Council to effect any such re-organisation of the staff as further experience may suggest; and, secondly, that a member of the Council would perform with greater ease and efficiency the duties hereunder specified, and especially the very important class of duties falling under head *c*, than could possibly be the case with an official not being a member of the Council. The duties for which they wish to make provision are the following:—

(*a*) To take the place and perform the duties (whether at meetings of the Council or its Committees) of the Chairman and Vice-Chairman, whenever either is absent or unable to act.

(*b*) To be responsible to the Council for the supervision of the permanent staff, for the general control of the heads of departments, and for the general superintendence of business.

(*c*) To be daily accessible to, and in regular communication with and between the Chairmen of the different Committees, and the heads of the various departments, and to afford them information and assistance concerning the course and conduct of business.

(*d.*) To abstain from practising or carrying on any business or profession.

Your Committee consider that these functions should be attached to the office of Deputy-Chairman. They are further of opinion that the legal knowledge and mastery of the various Acts regulating metropolitan administration of the present Deputy-Chairman would make his services of peculiar value in this office. They therefore recommend:—

"That, in consideration of his undertaking them, he should receive a salary at the rate of 2,000*l.* a year."*

The adoption of this report was moved by Sir John Lubbock, and seconded by Mr. Boulnois.

Colonel Rotton moved the following amendment:—

"That it will be more fitting with the dignity of the Council and the position of the Deputy-Chairman, that the office shall be unpaid, and that the executive duties of the Council shall continue to be discharged by a head clerk to be appointed for the purpose."

This was seconded by Mr. Foster, and, after a long discussion, the amendment was negatived by 79 (against) to 29 (for). On the Committee's recommendation being put as a substantive motion, Mr. Burns moved an amendment to the effect that the amount of the Deputy-Chairman's salary be 1,500*l.* In the course of the discussion which followed, Sir John Lubbock intimated that Mr. Firth had asked him to state that, so far as the amount of the salary was concerned, he was willing to leave himself in the hands of the Council. Mr. Antrobus, however, Mr. Augustus Harris, and other members, said that the salary ought not to be less than 2,000*l.*, and, on being put, Mr. Burns's amendment was lost by 60 against 41. The recommendation of the Committee was then adopted by 63 votes to 38.

Mr. Cohen moved that a rider be added to the effect that Mr. Firth be called upon to resign his seat in Parliament. This was lost, without a division, by a large majority.

Mr. Firth, M.P., the Deputy-Chairman, briefly returned thanks.

So much time having been absorbed by the foregoing business, the Chairman moved that at its rising the Council should adjourn until Friday, May 10, at three o'clock. This was agreed to. The first business to be taken at this supplemental meeting will be the further consideration of the Report of the Council Chamber and Offices Committee, which has stood adjourned since the meeting of the Council on April 9. [The substance of the Committee's report, and the text of the "minority report," were printed in the *Builder* for April 13, p. 283.]

THE CATASTROPHE AT SEVILLE CATHEDRAL.

SIR,—I have just returned from Spain, and by the courtesy of Signor Adolfo Casanova, the architectural director of the works, I have had an excellent opportunity of examining the cathedral at Seville.

The cause of the accident has been imperfect construction of the hearting of the piers, and in sundry cases the external ashlar work is of a weak stone, ill-suited to carry any weight. A plan of the church is given in Fergusson's "Handbook of Architecture." The scale on which Seville Cathedral is laid out is immense, the nave and transepts being about 50 ft. wide, the side aisles nearly 40 ft. These aisles are both of the same height, not far short of 100 ft. to the crown of

*The Committee, in a footnote, state that they are informed that the salaries of the Town Clerks in our principal provincial towns range from 3,500*l.* in Glasgow to 1,500*l.* in Leeds Bradford, and Newcastle.

the vault. The vault of the nave springs from immediately above the level of the crown of the aisle vault. The whole roof of the church, consequently, stands on a system of great clustered piers of the same height.

At the crossing the vault is raised some 25 ft. above the adjoining vault. This is called in Spain the *cimborio*, and is, in one form or another, a very general feature.

The church was begun in 1403, and was about 100 years in progress. In 1511 the *cimborio* fell down. The *cimborio* which fell stood very much higher above the roof than that which was almost immediately erected in its place. It must have been more like a central tower. The second *cimborio* is lighted by windows in the vertical walls, opening upon the outside of the vaults of the nave and transept. These vaults are the only roof of the church. There is no external roof above them, as would be required in a northern country.

The Chapter records show that the condition of the building had been a subject for anxiety on many occasions, and from the time of the fall of the *cimborio*, numberless reports were sent in as to repairs, &c. The building had also been shaken by sundry earthquakes.

The state of things had recently become so alarming that the building was placed in charge of the Government architect, and works were taken in hand to strengthen, repair, and, where thought necessary, to rebuild some of the great columns. Cross shores and struts were erected in all directions, and some columns were jacketed in timber.

It is possible that the building may have been somewhat shaken by the removal of the pillar in the south transept, next to that which has now fallen. On Aug. 1 last the south-west pillar, supporting the *cimborio*, fell with a crash.

One photograph, which I enclose, taken from the floor of the south transept, and looking north-east, shows the great springer fallen in one huge piece.

The other photograph, taken from the scaffold in the north transept, and looking south-west, shows a part of the arch of the great arcade still standing; the rest of the arch, with the superincumbent wall and clearstory, having crushed through the southern organ.

The choir stalls, superb works of the fifteenth century, have suffered at this point; but it is remarkable that so terrible an accident should have happened in the very centre of the building, with many workmen in it at the time, and no lives lost, or, except the stalls, much damage done to the works of art, of which the church is full.

Eleven pillars, in all, are to be rebuilt, and it is to be hoped that the very difficult and necessary work may be speedily and successfully carried through. In a country subject, from time to time, to earthquakes, more or less severe, no half measures can be adopted. The pillar that has been reconstructed is a splendid piece of work, and until the shaky pillars are as firmly re-established, the church cannot be considered secure.

It seems to be a most genuine work of restoration,—using that much-abused word in its true sense. SOMERS CLARKE.

15, *Dean's-yard, S.W.*, May 4, 1889.

WHITE PAINTS.

SIR,—In the *Builder* for April 27 [p. 309], an interesting article by Mr. H. C. Standage appeared, under the heading of "Some Special White Paints."

After referring to the extremely injurious effects on painters of ordinary white lead, the writer mentioned Freeman's Non-Poisonous White Lead.

I have been requested by Messrs. Freeman to correct some inaccuracies which, if passed over, might have a tendency to injure the reputation of this new pigment, and to ask you to oblige them by inserting this letter in your next issue.

In the first place it is worthy of note that the mere addition of oxide of zinc to sulphate of lead does not make a white pigment of any value, but that the density of the non-poisonous white lead is due to the special treatment set out in the specification of the patent. The following figures show this clearly:—

Sulphate of lead: 1 cubic foot weighs 168 lbs.

Oxide of zinc: 1 cubic foot weighs 58 lbs.

Mixture of three parts of sulphate of lead and one part of oxide of zinc: 1 cubic foot weighs 122 lbs.

Mixture of three parts sulphate of lead and one part oxide of zinc, made into Freeman's white lead: 1 cubic foot weighs 200 lbs.

Ordinary white lead averages about 160 lbs., and special quality white lead about 184 lbs. to the cubic foot.

According to the experiments Mr. Standage refers to, Freeman's white lead appears to require more oil to make it sufficiently thin than Griffith's White. Numerous experiments having been made here to test this point with the non-poisonous white lead in comparison with every white paint in the market, I am in a position to say that, so far from this being true, the reverse is the case. It is not necessary to quote results arrived at in these works, as a report is to hand of an examination made quite independently for a large buyer by a man of considerable experience:—

Griffith's Paint.	Freeman's Non-poisonous White Lead Paint.		Ordinary White Lead Paint.
Paint 2 oz.	2 oz.	...	2 oz.
Dryers ¼ oz.	¼ oz.	...	¼ oz.
Oil and Turpentine 10½ drs....	5 drs.	...	9 drs.

In this test the covering power of Freeman's white lead was found to be equal to best white lead.

As to the effect of various acids on the different white paints, any one reading Mr. Standage's article would suppose that the non-poisonous white lead is very easily acted upon by acids; whereas sulphate of lead, of which it is principally composed, is scarcely affected by them.

Ordinary white lead is readily affected by acids, but, notwithstanding, is a most durable paint.

Further, considering that white paint dries in about twenty-four hours, dropping concentrated acids on to paint in the wet state can give no indication of the slightest practical value as to the effect of minute traces of acid in a most diluted condition on white paint when the oil has had time to dry. HENRY SEWARD, F.C.S.,

Chemist at Messrs. Freeman's Works.

Battersea, May 1.

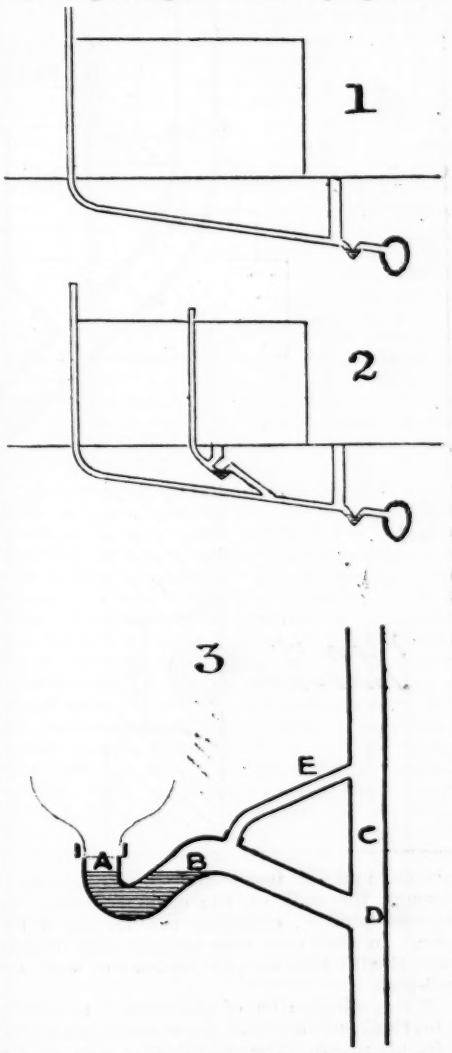
The Student's Column.

TOWN DRAINAGE.

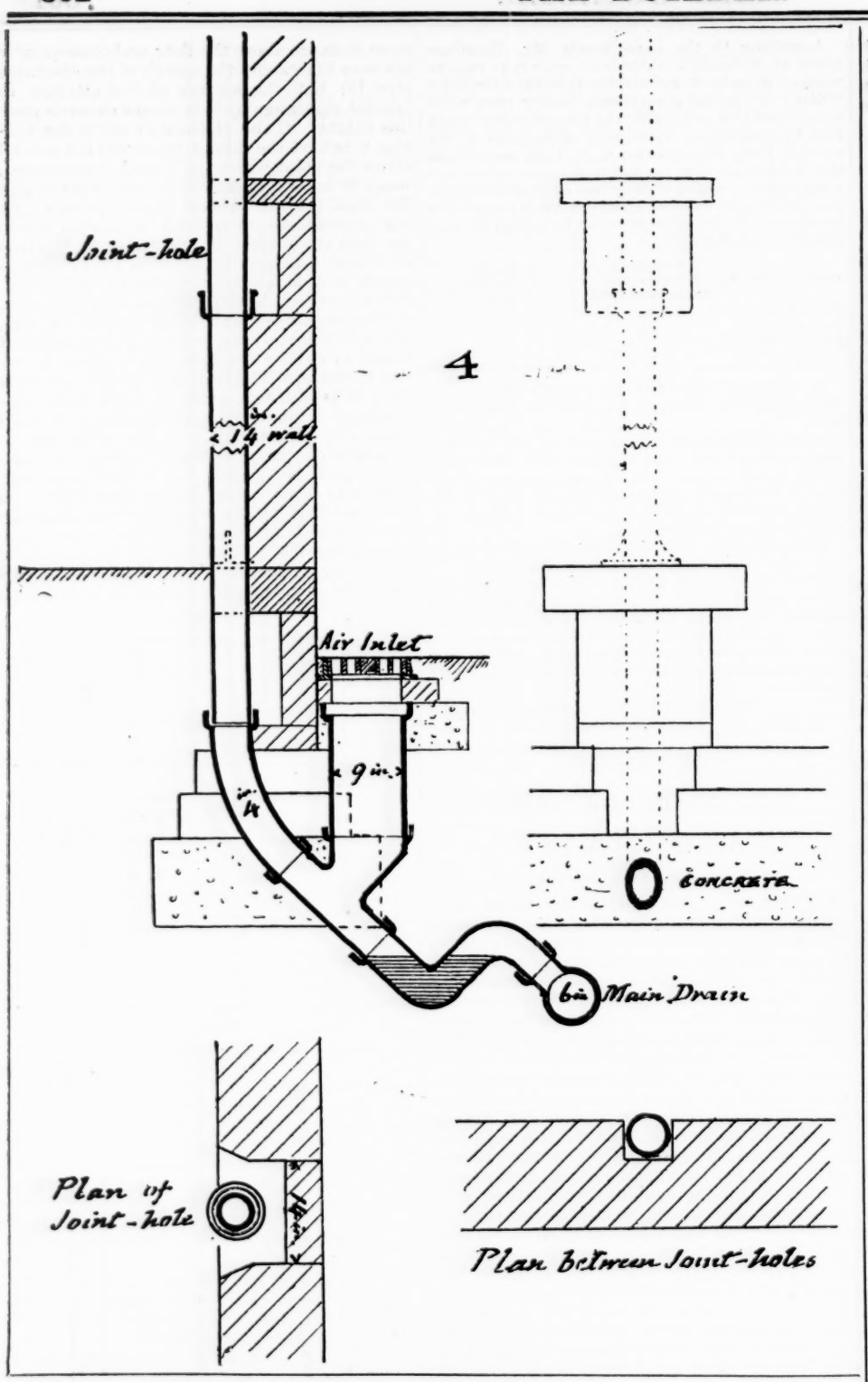
XIX.—SOIL-PIPES (*continued*).

THE air-course for the ventilation of a house-drain proceeds from its inlet at or near the ground level to its outlet by a vertical pipe erected at the far end of the drain, this pipe being in some cases the soil-pipe of a water-closet and in others a special pipe erected for the purpose, where upper water-closets are not situated at the far end of the drain,—as, indeed, they should not be, but sometimes are, in which case the soil-pipe is made use of for the ventilation of the whole drain. In this case the vertical soil-pipe is directly connected with the drain, a bend pipe being turned up to receive the foot of the soil-pipe, as in fig. 1; but when a special pipe is erected at the far end for the ventilation of the drain, and the water-closets are situated lower down, the soil-pipe is trapped at its foot, as in fig. 2. In laying the main portion of the drain a junction-pipe is inserted to receive this branch, which must enter the drain obliquely; care, therefore, must be taken not to over-run the true position of the junction-pipe, so that the branch may be laid from it at the angle required for making the ends of the pipes fit closely all round, one of the straight pipes being cut to the length required after the junction-pipe, the trap, and the air inlet-pipe have been laid, and the exact length of the branch can be ascertained, after which a bend is turned up to receive the foot of the soil-pipe. This does not rest upon the top of the bend, but is independently supported; and where a drain is laid to an already existing soil-pipe there must be height enough between the lowest support and the top of the bend to enable the joint to be made.

If the vertical pipe is of lead it will be supported on wood blocks, built into the wall, every 6 ft. or so in height, or as the plumber may require. A lead soil-pipe 4 in. internal diameter should be ⅛ in. thick, weighing a little more than 8 lbs. per lineal foot, and in exposed situations this is hardly a sufficient thickness, especially if the pipe be more than 4 in. diameter. Lead is the most convenient material for this purpose, but when a sufficiently large diameter is required it becomes expensive, and this has often caused its diameter to be made too small; and when, partly on this account, siphonage has taken place in water-closet traps, in the manner referred to in the last article, it has been attempted to prevent it by connecting the crown of the trap with the vertical soil-pipe by means of a short branch E in fig. 3. When the trap and soil-pipe are of lead this is easily done, if the connecting-pipe be carried up only a short distance above the floor, and consequently not very high above the mouth of the discharge pipe D; but the success of the attempt to prevent siphonage by this means depends upon this height. If the attenuated air in the soil-pipe C behind the falling water did not extend above the point where the branch is connected, —say 18 in. or 2 ft. above the mouth of the pipe D,—then the air passing down the pipe from the atmosphere, after each discharge, would act upon the surface of the water in the trap at B and balance the pressure of the atmosphere at A, and siphonage would be prevented. But, although it is easy to make this connexion at a height not much above the level of the trap, it is by no means easy to make it at a sufficient height to be effective, unless it be done in the first instance. When all other things have been fixed it is difficult,—and in some cases impossible,—to carry the connecting-pipe high enough up the soil-pipe, and the result has not always been that which was desired. A much better plan is to make the vertical pipe large enough to bring down the air from above the house with sufficient ease to follow the discharge of the water-flush closely, in which case no such connecting-pipe is necessary for the purpose of preventing siphonage: it has, however, another use, if large enough and carried up higher than



is shown in fig. 3, that, namely, of relieving the water surface B of the excessive pressure produced immediately below or in front of the descending water when the soil-pipe is so small that the water-flush fills it and forms a sort of plug, driving the air before it. This, however, cannot happen when the soil-pipe is large enough to let the air pass upwards while the water is descending. Its first effort is to do so, when compressed, and it only needs room enough to pass upwards and equalise the pressure behind the falling water; but, as this could not be wholly effected, whatever the size of pipe, it is necessary to supplement the deficiency by allowing the air to follow the water downwards easily, and nothing but a sufficiently large pipe can do this. Four inches may be a sufficient diameter if the height be not great, but if more than two storeys the size should be 4½ in. or 5 in. Plumbers do what they can to remedy the defect of a too small main pipe, and one plan is to carry up from the foot, or near the foot, of the soil-pipe a 2-in. or 2½-in. air-pipe, continuing this upwards beyond the highest



branch, and, if inside the house, turning it through the wall to the open air above the highest window, enlarging the mouth of the pipe. In that case they connect the branch-pipe E with this air-pipe, instead of with the soil-pipe.

If the soil-pipe be of cast-iron it should be ⅜ in. thick, and the joint space within the socket ⅝ in. all round. The weight of a 4-in. pipe is 17 lbs. per lineal foot, including the sockets. The lengths of pipe may be 9 ft., but special lengths to which branches are attached should be short. With iron pipes the branches are cast on with the body of the pipe, and these special lengths should be about 3 ft. The bottom length should be a flange-and-socket pipe, the flange near the lower end being bedded on hair-felt upon a stone laid across the lowermost joint-hole, as in the figure 4. The succeeding lengths of pipe are spigot-and-socket pipes to near the top, the last length through the roof being plain at both ends. The sockets should not be less than 3 in. deep, tightly caulked nearly full with tarred spun-yarn, and stopped with mastic. The air-tightness, however, depends upon the caulking, whether in these vertical pipes or in the horizontal pipes of the drain, and not upon the stopping in either case, which is only put in as a protection to the real jointing material. Lead may be run in, after the joint has been caulked to half its depth, if there is room at the back of the pipe for "setting up" the lead with a 2½-lb. hammer, and if the socket is strong enough to withstand the strain of setting up. This will be so if ordinary pipes cast for the use of water or gas works be used, which are purposely made with a strong rim; but the sockets of these ordinary pipes are ugly things when set up for the purpose of soil-pipes or air-pipes, and the sockets should be specially designed, not so thick and clumsy. If the joints be not caulked at all, they may be made with iron borings, or filings if clean, and sal-ammoniac, with flour of sulphur, mixed with water in small quantities, and used immediately. The soil-pipe, and its continuation upwards as an air-pipe, should not have any abrupt bend, whether of iron or lead, but a slight bend, or even two, in the air-pipe is of no great importance; in some situations, indeed, it cannot be avoided. When it is necessary to cut off a piece of the spigot-end of a cast-iron pipe, to suit the height of floors, this is easily done with a steel chisel, the point of which is diamond-shaped.

With iron pipes it is very necessary to protect them from rust *inside*, and no paint or varnish applied when the pipe is cold will last any long time. It can only be done when the pipe is hot, and is best done at the foundry, after the pipes have been cleaned, and before exposure to the air. The coating which has been found to answer best is melted coal-tar pitch, into which the pipes are dipped while at a temperature of about 300 deg. Fahr., being that of a dull red heat;—the process of the late Dr. Angus Smith, and called by his name.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

5,808, Artificial Stone. A. C. Ponton and others.

The product resulting from this process or method of manufacture, and which is the subject of this patent, is claimed to be of a superior character, combining great strength with durability. The process is based upon a chemical change which takes place when certain silicious substances are mixed and burned in exact proportions. All kinds of tiled or glazed ware may be made by the method, and either fine work with a surface as smooth as glass or coarse concrete blocks suitable for submarine work can be produced.

7915, Portland Cement. A. Fleiner.

According to this invention, a form is given to the bodies of the raw material such as will prevent "sintering" or baking together during the process of burning. The cement may be burned in ordinary pit-shafts or kilns.

8,040, Wash-out Basins. B. Robinson.

The improvement which is the subject of this patent consists chiefly in the construction of a basin with a hollow rim, which rim constitutes or takes the place of an after-service box, and provides a double flush. The fan or spreader has side wings, through which the water escapes so as to flow round the basin as usual, and has also a downward extension, at the bottom of which are small apertures for the flow of the after-supply from the rim.

8,270, Ventilators. C. Ellis.

According to this invention, ventilators formed with vanes or louvres may be opened, closed, and put in or out of operation easily, as desired. The action of the apparatus is managed by a telescopic screw, which, being actuated, forces the sections apart, and when it is desired to close the ventilator, the sections are drawn together, and are then wind and weather tight.

8,727, Sharpening Plane-irons. W. E. Plested.

According to this invention, a small roller, of cutting material, or metal supplied with emery, &c., is fixed in a cast-iron stand, in which also is fixed a notch or recess for holding the plane or chisel while being sharpened. It is claimed that the appliance will enable one who has had no experience to do what has hitherto required much skill and practice to perform.

3,893, Sand-faced Bricks. W. Johnson.

By this invention, machinery for producing the bricks is designed to act continuously, and to sand or roughen the face of the bricks automatically, thereby preventing frequent stoppage of the machinery for this purpose, and greatly increasing the output.

NEW APPLICATIONS FOR PATENTS.

April 23.—6,819, J. Jacquemin and E. Segrestan, Closing Orifices in Drain-pipes, &c.—6,822, S. Frederick, Metallic Roofing.

April 24.—6,860, J. Tall, Hinges for Ledge-doors.—6,863, R. Sharp, Lavatory Basin.—6,864, R. Sharp, Combined Waste and After-flush to Lavatory Basins.—6,874, J. Tata and J. Lyon, Mosaics.

April 25.—6,898, W. Barwell, Draught, Rain, and Dust Excluders for Doors.—6,915, G. Ewart and others, Metal Roofing.—6,930, A. Diss, Metal Dowel or Tenon for Door-frames, &c.—6,949, J. Middlehurst, Flushing Apparatus for Water-closets.

April 26.—6,953, J. Martindale, Ventilating and Chimney Cowls.—6,964, R. Watson, Window-fastener and Guide.—6,966, J. Bone and W. Wilton, Fastener for Window-sashes and Casements.—6,996, W. Thompson, Combined Sewer-gas Excluder, Trap, and Sink.—7,001, B. Mitchell, jun., Retaining Doors in any position when open.

April 27.—7,020, H. Kimpton, Tip-over Flushing Tank.—7,040, D. Davies, Window-catch.—7,056, J. Preston, Window-lock.—7,051, A. Washington, Paint.

PROVISIONAL SPECIFICATIONS ACCEPTED.

3,376, J. Becker and W. Winsloe, Cleaning, Whitewashing, and Painting Ceilings.—3,876, B. Finch, Stove.—4,016, W. Bakewell, Drip-dry Covering for Roofs.—4,084, L. Fraser and others, Set Squares.—4,393, F. Greenstreet and J. Lena, Sustaining Sashes.—4,436, W. Prideaux, Window-fasteners, &c.—4,494, A. Morrison, Fittings for Door Knobs and Spindles.—4,648, W. Dunn, Fire-grates.—4,896, J. Göbel, Brick Ovens.—5,120, A. Reid, Wood Screws.—5,255, W. Howlett, Fastenings for Doors.—5,342, A. Haghe, Raising Long Ladders.—5,378, H. Levetus, Door Springs and Checks.—5,384, W. Heathman, Band-saw Machines.—5,748, J. Willing, Fixing Letters and Devices to Facias, &c.—5,826, R. Robinson, Joint for Sanitary Pipes.—5,835, J. Shanks, Flushing Apparatus of Water-closets.—5,875, A. Clark, Leak-detectors for Pipes.—5,876, J. Carmichael and W. Whitman, Suspended Scaffold Stagings.—5,999, W. Jennings, Nails.—6,123, W. Ramsbottom, Flushing the Basins of Water-closets.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

5,697, A. Morrison and M. Ingram, Bath and Lavatory Fittings.—9,317, R. Stephens, Fastenings for Basement Windows.—14,073, R. Hyde, Raising and Lowering Sliding Windows.—4,855, G. Connell, Flue Ventilators.—5,076, F. Fry, Window-sash Fastener.—5,141, W. Devoll, Syphons for Flushing Water-closets.

RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

APRIL 17.—By W. BROWN & Co. (at Tring).

Tring, Park-rd.—Four f. houses, r. £64 p.a. £895
Two similar houses; and 3, 4, and 5, Albert-st., f., r. £76 p.a. 1,040

By WYATT & SON (at Chichester).

Chichester—14 and 15, Westgate, f., r. £25 p.a. ... 380

APRIL 18.—By WYATT & SON (at Chichester).

Portfield—A detached f. house 190
Florence-lane—Three cottages, f. 335

APRIL 29.—By W. BROWN & Co. (at Tring).

Tring—Thirteen f. houses, r. £103. 12s. 4d. p.a. 1,275

By G. A. WILKINSON.

Sunbury—F.g r. of £6 p.a., reversion in 35 yrs. 255
Old Kent-rd.—F.g.r. of £7. 12s., with reversion in 21 yrs. to e.r. of £30 305
Kennington—182, Kennington Park-road, c., r. £50 p.a. 550
22, Stannary-st., c., r. £12 p.a. 220
Blackfriars—46, Stamford-st., f., r. £70 p.a. 1,000
Banstead—F.g.r. of £7, reversion in 38 yrs. 140

By T. WOODS.

Isleworth—"Heston Lodge," with grounds, f., e.r. £120 p.a. 1,590

By T. MAY & Co.

Anerley, Croyden-rd.—"Brunswick Villa," u.t. 75 yrs., g.r. £12. 10s. 410

By EVES & SON.

Bromley-by-Bow—F.g.r. of £16, with reversion in 60 yrs. to £117 p.a. 360
City-rd.—103, East-rd., u.t. 58 yrs., g.r. £12. 10s., r. £65 p.a. 700
Camberwell—68 to 74 (even), East Surrey-grove, u.t. 73 yrs., g.r. £16, r. £114. 8s. p.a. 785
115, East Surrey-grove, u.t. 73 yrs., g.r. £3. 13s. 4d., r. £28. 12s. p.a. 205

By H. HOOPER.

Hammersmith—3, Edith-rd., u.t. 80 yrs., g.r. £6, r. £55 p.a. 650

APRIL 30.—By P. D. TUCKETT.

Kensington—An i.g.r. of £88. 13s. 9d., u.t. 15 yrs. . 800

By W. HOLCOMBE.

St. James's—The lease of 16, Bury-st., u.t. 19 yrs., r. £200 p.a. 1,400
Marylebone—97 and 99, Lisson-grove, u.t. 26 yrs., g.r. £18, r. £120 p.a. 900
7, Earl-st., u.t. 26 yrs., g.r., £18, r. £38 p.a. 250
5 and 6, Exeter-st., u.t. 26 yrs., g.r. £21. 6s., r. £70 p.a. 570
93, North-st., u.t. 33 yrs., g.r. £7. 17s., r. £45 p.a. 440
St. Pancras—34, Osnaburgh-st., u.t. 34 yrs., g.r. £26; and 35, Clarence-gdns., same term, g.r. £16, r. together £59 p.a. 520

By DEBENHAM, TEWSON, & Co.

Herne-hill—Shrubbery Lodge, and 2a. 2r. 3p., f. ... 3,500
Camberwell—70 and 72, Denmark-st., f., r, £32. 19s. p.a. 575
Maida-hill—96, Portsdown-rd., u.t. 61 yrs., g.r. £20, r. £70 p.a. 450

By W. & F. HOUGHTON.

Snaresbrook—Castle House, and 3a. 2r. 2p., f. 5,000
Stratford—28 to 46 (even), Chapel-st., f., r. £166. 8s. p.a. 1,850

By THURGOOD & MARTIN.

Brondesbury—9, Mowbray-rd., u.t. 90 yrs., g.r. £15, r. £80 p.a. 905
Battersea—6, Queen Anne-ter., u.t. 89 yrs., g.r. £10, r. £40 p.a. 400

By R. J. COLLIER.

Winchmore Hill—The f. residence, "Highfield," and 3a. 0r 17p. 2,000
Stamford Hill, Amhurst-rd—"Grasmere," u.t. 76 yrs., g.r. £16., e.r. £120 1,550

By E. G. SIM.

Kensington—3a and 4a, Manchester-st., u.t. 76 yrs., g.r. £12. 12s., e.r. £67. 12s. 50
Acton Green—2, Beaumont-rd., u.t. 92 yrs., g.r. £6. 10s., e.r. £40 p.a. 85
Holloway—35, Devonshire-rd., l., sold after auction for 425

By W. BROWN & Co. (at Marsworth).

Marsworth, Bucks—A residence with five cottages and orchard and meadow land, f. 765

MAY 1.—By BEARD & SON.

Westbourne-grove—No. 59, u.t. 12 yrs., r. £250 p.a. 1,100
63, Westbourne-gr., u.t. 12 yrs., r. £270 p.a.; and 49, Kensington-gdns-sq., u.t. 12 yrs., r. £170 p.a. 1,125

By F. J. BISLEY.

South Bermondsey—13, 15, and 17, Westlake-rd., u.t. 67 yrs., g.r. £1. 10s., r. £72. 16s. p.a. 550
Highbury—155, Green Lanes, u.t. 81 yrs., g.r. £15, r. £70 p.a. 945

By J. G. & A. PREVOST.

Mile End—4, Leslie-st., u.t. 40 yrs., g.r. £3. 10s., r. £26 p.a. 400
Commercial-rd.—54 to 60 (even), Grove-st., u.t. 12¾ yrs., g.r. £16. 16s. 100
Bow—100, Malmesbury-rd., u.t. 58 yrs., g.r. £4, r. £28 p.a. 315
Mild End—326, Oxford-st., f., r. £49. 8s. p.a. 400
119, White Horse-la., f., r. £44. 4s. p.a. 420
East Dulwich—The residence, "Hill Brow," u.t. 30 yrs., g.r. £12. 10s., r. £42 p.a. 280
Poplar—17, 19, and 21, Ricardo-st., u.t. 39 yrs., g.r. £5, r. £49. 8s. p.a. 220
Stratford—66, Albert-rd., u.t. 71 yrs., g.r. £3, e.r. £26 p.a. 145

By BROAD & WILTSHIRE.

Ore, near Hastings—Twelve plots of f. land 2,170

MAY 2.—By WORSFOLD & HAYWARD.

Dover—8 and 9, Union-row, f., r. £29 p.a. 460
39, Military-rd., f., r. £16 p.a. 255
10, Selborne-ter., f., r. £19 p.a. 280
84, Limekiln-st., u.t. 38 yrs., g.r. £5. 10s. 180
Charlton—41, Tower Hamlets-st., f., r. £10 pa. 130

By G. BRINSLEY.

Walworth—5, 7, and 9, King and Queen-st., u.t. 68 yrs., g.r. £10. 10s., r. £58. 10s. p.a. 360
31 to 37 (odd), Aylesbury-st., u.t. 24 yrs., g.r. £13, r. £122. 8s. p.a. 540
13 to 33 (odd), Webster-st., u.t. 57 yrs., g.r. £16. 10s., r. £371. 16s. p.a. 3,085

By FAREBROTHER, ELLIS, & Co.

Goswell-rd.—"The Shakespeare" p.h., r. £59 p.a., f. 2,100

By E. HOLSWORTH.

Forest Gate—9, Odessa-rd., f., r. £26 p.a. 300

By NEWBON & HARDING.

Finsbury Pk.—16 to 22 (even), Victor-rd., u.t. 75 yrs., g.r. £24, r. £128 1,000
Hackney—70, Well-st., u.t. 43 yrs., g.r. £5, e.r. £45 p.a. 300
Stoke Newington—31 and 33, Milton-rd., u.t. 63 yrs., g.r. £5. 4s., e.r. £51 p.a. 455
Holloway—29, Lorraine-rd., f., r. £48 p.a. 605
1, 2, and 3, Lorraine Cottages, f., r. £58. 10s. p.a. 475
City-rd.—20, Westmoreland-st., f., r. £32. 10s. p.a. 385
Putney Bridge-rd.—"Park Lodge," u.t. 89 yrs., g.r. £21, e.r. £100 p.a. 610
Somers Town—i.g.r. of £109, held for 52 yrs. at £70 p.a. 320

By E. EVANS.

Wandsworth, Burntwood-lane—Four residences, u.t. 91 yrs., g.r. £24, r. £123. 8s. p.a. 995
Battersea—26 and 28, Edna-rd., u.t. 88 yrs., g.r. £6, r. £70. 4s. p.a. 540

MAY 3.—By TOWERS, WILLIAMSON, & ELLIS.

Bayswater—144, Inverness-ter., u.t. 52 yrs., g.r. £12, r. £95 p.a. 1,210

By DOLMAN & PEARCE.

Hampstead—98, Adelaide-rd., u.t. 56 yrs., g.r. £15, with possession 750

By BAKER & SONS.

Westminster—The letting for a term of 80 yrs. of land containing an area of 24,270 ft. in York-st. and Palmer-st., at £2,150 p.a., before the auction.
The 2,751 ft. in Palmer-st., let for same term at £160 p.a. also before the auction.

By HERRING, SON, & DAW.

Brixton-hill—6, Gilbert-villas, u.t. 59 yrs., g.r. £13. 10s., e.r. £140 p.a. 1,000

[*Contractions used in this list.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

MEETINGS.

SATURDAY, MAY 11.

Architectural Association.—Visit to the Imperial Institute. 3 p.m.

Association of Public Sanitary Inspectors.—Major Greenwood, jun., M.D., on "The Great Plague of London, with special reference to the Sanitary state of the Metropolis in 1665 and 1889." 6 p.m.

MONDAY, MAY 13.

Society of Arts (Cantor Lectures).—Mr. H. Graham Harris, on "Heat Engines other than Steam." II. 8 p.m.

Liverpool Architectural Society.—Mr. J. Starkie Gardner on "Early English Ironwork." 7 p.m.

TUESDAY, MAY 14.

Society of Arts (Applied Art Section).—Dr. Salviati on "Venetian Glass." 8 p.m.

Royal Institution.—Dr. Jean Paul Richter on "The Italian Renaissance Painters." III. 3 p.m.

Institution of Civil Engineers.—Further discussion on Mr. W. H. Greenwood's paper on "The Treatment of Steel by Hydraulic Pressure, and the Plant employed for the purpose." 8 p.m.

WEDNESDAY, MAY 15.

Royal Meteorological Society.—(1) Mr. W. H. Dines, B.A., will give "An Account of some Experiments made to investigate the connexion between the Pressure and Velocity of the Wind." (2) Two other papers will be read. 7 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting. 8.30 p.m.

British Archæological Association.—(1) Mr. T. Morgan, F.S.A., on "Phases of Early Christianity." (2) The Rev. Scott Surtees on "Earl Godwin and his Sons." 8 p.m.

Society of Arts.—Mr. A. F. Yarrow "The Use of Spirit as an Agent in Prime Movers." 8 p.m.

THURSDAY, MAY 16.

Sanitary Institute.—Mr. H. E. Davis on "Fires and Fire Escapes, and the Prevention and Arrest of Fires." 5 p.m.

Society of Antiquaries.—8.30 p.m.

Edinburgh Architectural Association.—Valedictory Address by the President (Professor G. Baldwin Brown, M.A.). 8 p.m.

FRIDAY, MAY 17.

Architectural Association.—(1) Mr. D. J. Blow on "The Travelling Students' Notes." (2) Election of Officers for ensuing session. 7.30 p.m.

SATURDAY, MAY 18.

Edinburgh Architectural Association.—Visit to Arniston House and Temple Church.

The Association of Municipal and Sanitary Engineers held a Home Counties District meeting at Southampton on Saturday last, but we regret that we have no space to devote to it this week.

Miscellanea.

The New Hospital for Women.—The foundation stone of this hospital was laid by H.R.H. the Princess of Wales on Tuesday, the 7th inst. The new building is being erected on the north side of Euston-road, near Euston-square. It comprises three main blocks, viz.:—the central, for administration and private wards; the south or rectangular pavilion, having the entrance hall and a medical institute room on the ground floor, with two floors of wards above; and the north or circular pavilion, having the out-patient department on the ground-floor, and two floors of circular wards above. The pavilions are connected with the central block by covered ways, which can be thrown open at pleasure, so as to secure the most complete isolation possible for the wards. The towers containing the baths and closets are connected with the wards in a similar manner. Besides a large out-patient department, accommodation will be provided for forty-two beds in two rectangular wards, 42 feet by 26 feet, for ten beds each, giving 109 square feet and 1,474 cubic feet per bed, and two circular wards, 35 feet diameter, for nine beds each, giving 107 square feet, and 1,444 cubic feet per bed. The remainder are in private wards. The kitchens and nurses' rooms will be on the third floor. The materials employed for the walls are stock bricks, with red brick for cornices, quoins, window-dressings, &c. Internally the walls of the out-patients' waiting-room, the bath-rooms, closets, &c., are lined with cream-coloured glazed bricks, and the wards will be finished in Parian cement. The floors throughout will be fireproof, of iron and concrete, on Messrs. Homan & Rodgers's system, the wards being laid with oak-block flooring, and the corridors with cement mosaic. The building is being carried out from the designs of Mr. J. M. Brydon, F.R.I.B.A. The general contract has been taken by Messrs. Higgs & Hill, of South Lambeth; the warming and ventilation has been entrusted to Mr. D. O. Boyd, of Maddox-street; and Mr. William Lawrence is clerk of the works. The Committee have also had the advice and co-operation of Miss Florence Nightingale and Sir Douglas Galton on sanitary and other arrangements.

Art-workmanship Competition, 1889. The judges appointed by the Council of the Society of Arts have awarded the following (among other) prizes for objects submitted in the above competition.—Stone Carving: First Prize not awarded; Second Prize (15*l.*) to W. H. Fry, Cheltenham, for a capital of a column, carved in the Early English style of architecture. Second Prize (15*l.*) to Josiah Farmer, Cheltenham, for an octagonal capital of a column, carved in fifteenth-century style of architecture, with thistle foliage ornament. Third Prize (10*l.*) to William Vickers, Camberwell, for a capital of a column, carved with bramble foliage and birds. Fourth Prize (5*l.*) to Frederick Nelson, Teignmouth, South Devon, for a Sicilian marble capital of a column," carved with a design, "Common objects of the sea-shore." Wrought-iron work: First Prize (£25) to S. C. Hobbs, London, for a wrought-iron grille for inside window-screen or glass door-panel. Second Prize (£15) to William Hooks, London, for a wrought-iron grille for vestibule door. Designed by G. F. Henney. Third Prize (£5) to Henry Ross, London, for a wrought-iron grille for street door. The whole of the work sent in for competition in this class is highly commended.

The Industrial and Art Exhibition at Bremen.—*Apropos* of the Industrial and Art Exhibition to be held next year at Bremen, which is open to foreign competitors in respect of steam-engines, motors, machinery, and implements for the manufacture of wood, leather, and metals, and to which we recently referred, we have to add that all applications for space should be addressed to the "Bureau der nordvestdeutsche Gewerbe und Industrie Ausstellung," in Bremen, before March 1, 1890, and the exhibits received before May 15, of that year.

Monument to John Ericsson.—The Senate of the city of New York has decided upon erecting a monument to the late John Ericsson, the famous Swedish inventor, in the Central Park, at a cost of 10,000 dols.

The New Government Buildings at Christiania.—The second competition for the designs for the new Government buildings at Christiania is now taking place, the architects entitled to compete having been reduced to five.

Society of Engineers.—At a meeting of the Society of Engineers, held at the Town-hall, Westminster, on Monday evening, May 6, Mr. Jonathan R. Baillie, President, in the chair, a paper was read by Mr. Perry F. Nursey (Past-President) on "Recent Developments in High Explosives." The author first pointed out the importance of high explosives, and instanced the removal of Flood Rock at the entrance to East River, New York, in 1885, when 150 tons of nitro-glycerine compounds were simultaneously exploded. He then described the special features of various explosives, and compared their action, showing how explosion in some was intensely rapid and smashed the rock within a limited area, whilst in others the rate of explosion was more retarded, so that they rent and fissured the ground over a large area, to the manifest advantage of the miner. He then referred to the detrimental fumes evolved by the explosion of dynamite, and pointed out that these fumes were absent from some of the comparatively slower burning compounds which had time for perfect combustion. He briefly referred to some of the earlier explosives which had been described in previous papers read by him on the subject of explosives. He next pointed out that during the existence of the dynamite patent the field was closed against other nitro-glycerine compounds in this country, although on the Continent and in America they flourished. On the expiry of that patent, however, in 1881, there was everywhere renewed activity in the invention of nitro-glycerine compounds. The author then showed that there were practically over three hundred varieties of explosives of all classes, and including gunpowder, but that commercially the list of high explosives was a comparatively short one, and had reference mainly to those of more recent date. This list included Dynamite, Lithofracteur, Blasting Gelatine, Gelatine Dynamite, Gelignite, Roburite, Securite, Bellite, Carbodynamite, Von Dahmen's Safety Dynamite, Hengst's Powder, Cotton-powder, Tonite, Potentite, and Mélinite. The author explained the composition and special attributes of each of these explosives, and detailed the results of experiments and practical trials he had made with many of them, and of the practical work he had done with several of them. This latter included the bringing down of some 400 tons of rock in Jersey harbour at one blast; the demolition of a bridge in Belgium, and the chambering of the hard chalk 400 ft. down a trial boring 4¾ in. diameter, and under a 350 ft. head of water. The two former blasts were made with Lithofracteur and the latter with Carbo-dynamite. The author described some heavy blasts which had been effected with gunpowder and nitro-glycerine compounds at various times, and gave the results of work done as being from 3·0 tons to 3·50 tons of rock brought down per pound of high explosive used, which agreed with the results he had himself obtained. He concluded by pointing out that the same explosive was not suitable for every kind of work, but that the present tendency of manufacturers and inventors was to so modify and regulate the explosive force of blasting compounds that they could be made generally available for any kind of ground.

The Institute of Builders.—At a meeting of this Institute, held on the 7th inst. at 31, Bedford-street, W.C., Mr. Frank May, J.P., presiding, Mr. Richard S. Henshaw was presented with an illuminated address, which read as follows:—

"To Richard S. Henshaw, Esq., Secretary of the Institute of Builders.

Sir,—We, the undermentioned, desire to record our appreciation of the sincere and earnest manner in which you have carried out your duties in connexion with the several Societies of Builders of which we are members.

We further desire to offer you our good wishes for health and happiness on the occasion of your marriage, and beg your acceptance of the accompanying clock and purse of fifty guineas as a token of our regard."

[Signed by upwards of seventy leading builders and building firms.]

Draycott Sewerage.—Mr. J. T. Harrison, C.E., held a Local Government Board inquiry at Draycott on the 2nd inst., to consider an application to borrow 2,700*l.* for sewerage and sewage disposal. Mr. W. H. Radford, C.E., of Nottingham, is the engineer for the scheme, and he explained that it was proposed to deal with the sewage by irrigation on six acres of specially prepared land. The district is very flat, and there has been great difficulty in arranging the levels of the sewers to act efficiently without pumping.

Discovery in Stratford Parish Church. In connexion with the removal of the organ from the north transept to the east end of the south aisle, workmen were on Saturday engaged in taking up a portion of the floor at the Church of the Holy Trinity, Stratford-on-Avon, when the Vicar (the Rev. G. Arbuthnot) caught sight of a stone slab, buried about 2 ft. below the floor level. Upon one end of the stone was a carved cross, and the Vicar at once gave orders for the whole of the stone to be uncovered. Substantial rows of brickwork had been built across the stone to support the floor, and upon these and a quantity of *débris* being removed, the large ancient altar-stone, 9 ft. 6 in. by 3 ft. 6 in., belonging to Thomas à Becket's Chapel, was disclosed. The front edge of the stone is beautifully polished and bevelled, and already three of the five crosses which altar-stones usually bear have been discovered. The stone is covered with incrustations of dirt through being buried in the ground. The existing south aisle, which contains the chapel, was rebuilt early in the fourteenth century,—probably about 1330,—by John de Stratford, Bishop of Winchester, afterwards Archbishop of Canterbury, a native of Stratford, who founded the chapel, which he dedicated to Thomas à Becket, and the Vicar believes the stone just discovered to be the original slab which formed the altar. It will be taken up and very carefully preserved. Near the spot, at the back of some oak panelling, were also found the remains of the old piscina.—*Birmingham Daily Post.*

Edinburgh.—The heating and ventilation of the McEwan Hall, University of Edinburgh, now in course of erection under the superintendence of Dr. Rowand Anderson, has been entrusted to Mr. Wilson W. Phipson, C.E., of London. The scheme accepted is mechanical ventilation by propulsion, with a low-pressure steam principle of heating, the distribution of the air for ventilating the hall being similarly arranged to that carried out by him at the Royal Albert Hall, Kensington. At the Scottish National Portrait Gallery, now approaching completion, Mr. Phipson has also carried out, under the same architect, his system of heating by distinct circuits on the low-pressure steam principle, all the water of condensation being returned to the boiler by gravity, the advantage claimed for this method being that each floor is distinct in its heating arrangements, and the temperatures are under control near the boiler, where is fixed the sectional heat distributor.

The Sanitary Institute.—Mr. G. W. Hastings, M.P., has accepted the Presidentship of the Congress of the Sanitary Institute, which is to be held in Worcester, commencing Sept. 24 next.—At an examination held for Inspectors of Nuisances, May 2 and 3, seventy-six candidates presented themselves. Questions were set to be answered in writing on the 2nd, and the candidates were examined *viva voce* on the 3rd. Thirty-eight candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspector of Nuisances. The examination for Local Surveyors will be held on Thursday and Friday, July 25 and 26.

The Swedish Granite Industry.—The well-known granite quarries at Sternö and Stilleryd, in Sweden, have been sold to a company, which will increase the number of workmen to 300, and double the outturn, whilst the granite is to be exported direct in the company's own steamers. Hitherto the stone has chiefly been shipped to Russia, Germany, and Denmark, but now attempts are to be made also to introduce it in the English market.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	10	0	7	10	0
Teak, E.I.....load	11	0	0	15	0	0
Sequoia, U.S.....foot cube	0	2	3	0	3	0
Ash, Canada.....load	3	10	0	5	0	0
Birch ,, ...	3	10	0	6	0	0
Elm ,, ...	4	0	0	5	0	0
Fir, Dantsic, &c.	2	0	0	3	10	0
Oak ,, ...	2	10	0	4	10	0
Canada	5	10	0	7	10	0
Pine, Canada red	3	5	0	4	0	0
,, yellow	3	10	0	5	10	0
Lath, Dantsic.....fathom	4	10	0	5	10	0
St. Petersburg.....	5	0	0	6	10	0
Wainscot, Riga, &c.....log	2	15	0	4	5	0
,, Odessa, crown.....	0	0	0	0	0	0
Deals, Finland, 2nd and 1st...std.100	9	10	0	11	0	0
,, ,, 4th and 3rd.....	8	0	0	9	0	0
Riga	7	10	0	9	0	0
St. Petersburg, 1st yellow	11	0	0	15	0	0
,, 2nd ,, ...	10	0	0	11	0	0
,, white	7	10	0	10	10	0
Swedish	9	0	0	16	0	0
White Sea	9	10	0	17	0	0

TIMBER (*continued*).	£.	s.	d.	£.	s.	d.
Deals—Canada, Pine, 1st	16	0	0	26	10	0
,, ,, 2nd	11	0	0	17	10	0
,, ,, 3rd, &c.	8	0	0	10	10	0
,, Spruce, 1st	9	10	0	11	0	0
,, ,, 3rd and 2nd	7	10	0	9	0	0
New Brunswick, &c.	6	15	0	8	15	0
Battens, all kinds	6	10	0	20	0	0
Flooring Boards, sq., 1 in., prepared, First	0	11	0	0	14	6
Second	0	8	0	0	10	0
Other qualities	0	5	6	0	7	0
Cedar, Cuba.....foot	0	0	4½	0	0	4½
Honduras, &c.....	0	0	4	0	0	4½
Mahogany, Cuba	0	0	4½	0	0	6½
St. Domingo, cargo average	0	0	4½	0	0	6½
Mexican ,, ...	0	0	4½	0	0	5½
Tobasco ,, ...	0	0	5½	0	0	6½
Honduras ,, ...	0	0	5½	0	0	6½
Box, Turkey .....ton	4	0	0	12	0	0
Rose, Rio.....	15	0	0	20	0	0
Bahia	14	0	0	18	0	0
Satin, St. Domingo .....foot	0	0	6	0	1	0
Porto Rico	0	0	9	0	1	3
Walnut, Italian	0	0	4½	0	0	6½
METALS.						
Iron—Bar, Welsh, in London...ton	5	5	0	5	10	0
,, ,, at works in Wales ...	4	15	0	5	0	0
,, Staffordshire, in London ...	5	10	0	6	10	0
Copper—						
British, cake and ingot..... ton	43	0	0	44	0	0
Best selected	44	0	0	45	0	0
Sheets, strong	50	0	0	0	0	0
Australian	0	0	0	0	0	0
Chili, bars	38	10	0	0	0	0
Yellow Metal.....lb.	0	0	5	0	0	5½
Lead—Sheet, English.....ton	13	10	0	14	0	0
Spelter—						
Silesian, special .....ton	17	10	0	17	12	6
Ordinary brands.....	17	7	6	17	10	0
Tin—						
Straits .....ton	90	0	0	0	0	0
Australian	90	0	0	0	0	0
English Ingots.....	93	0	0	0	0	0
Zinc—English sheet .....ton	21	0	0	22	0	0
OILS.						
Linseed .....ton	18	12	6	18	17	6
Cocoanut, Cochin	27	0	0	28	0	0
Ceylon	25	0	0	25	10	0
Palm, Lagos	24	0	0	0	0	0
Rapeseed, English pale	26	10	0	0	0	0
,, brown	25	0	0	0	0	0
Cottonseed, refined	24	10	0	25	10	0
Tallow and Oleine	19	0	0	45	0	0
Lubricating, U.S.	5	0	0	6	0	0
,, refined	7	0	0	12	0	0
Tar—Stockholm .....barrel	1	2	9	1	3	0
Archangel	0	15	6	0	0	0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *Noon on Thursdays.*]

COLCHESTER.—For alterations and reparations at the cemetery, for the Colchester Joint Burial Board. Mr. J. W. Start, architect, High-street, Colchester:—

F. Dupont...	£275	0	0
G. Farran	226	0	0
H. Cook	210	0	0
T. J. Ward.....	210	0	0
Bloyce & Son.....	185	0	0
W. Shead	178	0	0
R. Beaumont.....	170	0	0
Orfeur (accepted).....	133	0	0

DARENTH (Kent).—For electric fire-signal system at the School and Asylum for Imbeciles, Darenth, Kent, for the Metropolitan Asylum Board. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C.:—

Binko & Co.	£749	10	0
Lovett, F. J.....	625	0	0
Bailey & Grundy.....	558	0	0
Strode & Co.	540	0	0
Sax, J.	488	0	0
Wadley Bros.	473	8	0
Cox & Walkers.....	438	8	0
Harrison & Co.....	420	0	0
Blenheim & Co.....	398	0	0
Fowler, Lancaster, & Co.	389	10	0
Spagnoletti & Crooks	348	0	0
Gent & Co.....	333	0	0
Dale & Co., Limited, Ludgate-hill, E.C. (accepted)	318	0	0

DARENTH (Kent). — For additional fire-extinction appliances at the School and Asylum for Imbeciles, Darenth, Kent, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. Quantities not supplied:—

Jennings & Co.	£850	0	0
Ridsdale & Co.	847	0	0
Merryweather & Co.	792	10	0
Clements, Jeakes, & Co.	690	10	0
Hayward Bros. & Eckstein	625	0	0
Shand, Mason, & Co.	597	10	0
R. Crane.....	589	0	0
J. & F. May,* 259, High Holborn, W.C.	520	0	0

* Accepted.

FAY GATE (Sussex).—For repairs and additions to the residence of Mr. H. M. Beaumont. Mr. R. T. H. Stoneham, architect, 6, Moorgate-street, E.C.:—

D. Harding, Fay Gate	£420	0	0
Rouland Bros., Horsham	385	0	0
H. Bridel, London (accepted).....	300	0	0

GLASBURY.—For the erection of villa residence, Glasbury, Brecknockshire. Mr. W. W. Robinson, architect, 10, King-street, Hereford:—

Bowers & Co., Hereford	£935	0	0
Deakin, Knucklas	879	0	0
Evans, Erwood	800	0	0
Hiles, Hereford	760	0	0
Lewis & Co., Hereford	755	0	0
J. Price, Hay (accepted)	710	0	0
Webb, Hay	690	0	0

[Stone and bricks supplied.]

CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

CONTRACTS.

Nature of Work, or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Cleft Oak Fencing	Willesden Burial Board	O. Claude Robson	May 14th	ii.
Private Street Works	East Ham Local Board	W. H. Savage	do.	ii.
Asphaltic Tar-paving	do.	do.	do.	ii.
Roadmaking and Paving Works	Willesden Local Board	O. Claude Robson	do.	ii.
Broken Granite	Chiswick Local Board	A. Ramsden	May 15th	x.
Making-up Grove Park-road	do.	do.	do.	x.
Supply of Stone	Folkestone Corporation	A. W. Conquest	May 18th	x.
Sewerage Works	Richmond R.S.A.	F. Wentworth-Shields	May 20th	x.
Paving Road	Brentford Local Board	J. H. Strachan	May 21st	x.
Portland Cement, Wood Blocks, Ballast, &c.	Chelsea Vestry	G. R. Strachan	do.	x.
Broken Granite	Croydon Corporation	W. Powell	do.	ii.
Broken Granite	Chelmsford Town Coun.	*Official*	do.	ii.
Dwarf Walls, Iron Railings, and Tree Guards	St. Mary, Islington, Vestry	J. P. Barber	do.	xi.
Cast-iron Tank, Columns, &c.	St. Helen's Corporation	G. J. C. Broom	May 22nd	x.
Broken Granite	Canterbury Corporation	*Official*	May 23rd	ii.
Shedding, Lambeth	Commis. of Sewers	do.	May 24th	ii.
Waterworks	Faringdon Union R.S.A.	F. H. Barfield	do.	ii.
Sorting Office, Mount Pleasant	Com. of H.M. Works	*Official*	do.	ii.
Drill Shed	Newcastle Engin. Vol.	.....	May 25th	xi.
Sewerage Works	Hampton Wick Loc. Bd.	*Official*	do.	xi.
Waterworks	Liverpool Corporation	G. F. Deacon	May 27th	x.
Fittings, Bristol Post Office	Com. of H.M. Works	*Official*	May 28th	x.
Completion of Swimming Bath	St. Mary Abbotts, Kensington, P.B.&W.Com.	T. Verity	do.	x.
Painting Works, Hyde Park Barracks	War Department	*Official*	Not stated.	ii.
Pulling down, &c. "Lord Nelson," Greenwich	Mr. J. Smalley	.....	do.	ii.
Gulley Ladles	School Bd. for London	*Official*	do.	x.
Enlargement of Schools	do.	do.	do.	x.
Cutting-out Tables, Rack Cupboards, & Chairs	do.	do.	do.	x.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Draughtsman in Patent Office	Civil Service Com.	Not stated	June 5th	xvi.
C. E. Draughtsman	Portsmouth Dockyard	8s. per day	Not stated	xvi.

HANDSWORTH (Birmingham).—For constructing No. 7 section of the arterial drainage works, for the Local Board. Mr. E. Kenworthy, A.M.Inst.C.E., Engineer:—

G. Trentham, 14, Broad-street-corner, Birmingham (accepted)	£736 12 6

[Pipes provided by the Local Board.]

HANDSWORTH (Birmingham).—For the erection of two semi-detached villas, in Hamstead-road, for Mr. Henry Price:—

L. Gosling, Birmingham	£1,040 0 0
J. Archer, Birmingham	1,036 0 0
J. Kirby, Handsworth	974 0 0
A. J. Handscomb, Handsworth	905 0 0
J. Drinkwater, Handsworth	878 0 0
G. Trentham, 14, Broad-street-corner, Birmingham (accepted)	875 10 0

HEREFORD.—For the erection of villa residences, Holmer, Hereford. Mr. W. W. Robinson, architect, Hereford:—

Davies	£580 0 0
Williams	551 0 0
Lewis & Co.	520 0 0
Bearan & Hodges	496 0 0
Bowers & Co.	489 0 0
J. Hiles (accepted)	433 0 0

[All of Hertford. The price is exclusive of bricks and tiles.]

HIGH BARNET.—For erecting detached house, High Barnet, for the Rev. J. Matthews. Mr. Geo. Baines, architect, 4, Great Winchester-street, E.C.:—

S. J. Scott, London	£1,527 0 0
R. G. Battley, London	1,396 0 0
John Curnow, High Barnet	1,333 0 0
J. Ellwood, New Barnet	1,300 0 0
F. J Coxhead, Leytonstone	1,247 0 0
J. Baughen, Barnet	1,239 0 0
John Willmott & Sons, Hitchin*	1,194 15 0

[Architect's estimate, £1,200.]
* Accepted.

HINCKLEY.—For supplying and fixing oak ingle-nook and panelling, and wood ribbed ceiling, at Higham Grange, Hinckley, for the Hon. E. H. Pierrepoint. Mr. R. J. Goodacre, architect:—

C. Hindley & Sons (accepted)	£234 0 0

KINGSLAND.—For the erection of carriage-houses and workshops over, for Mr. William Titford. Mr. Walter Graves, architect, Winchester House, E.C.:—

J. R. Hunt	£530 0 0
J. Mansbridge	518 0 0
Jarvis & Sons	495 0 0
Keen	420 0 0
Ivory	420 0 5

LINCOLN.—For the erection of new offices and additions to the Excelsior Concrete Masonry Works of Messrs. Fambrini & Daniels, Lincoln. Mr. W. Mortimer, architect, Lincoln:—

H. S. & W. Close	£270 0 0
S. Horton	259 10 0
J. M. Harrison	253 0 0
R. Crossby	216 6 0
G. Cowen (accepted)	215 0 0

[All of Lincoln.]

LONDON.—For new shop front and interior fittings to No. 37, High-street, Harlesden, N.W., for Mr. Wormald, confectioner. Mr. Wm. Hunter Turner, architect, 58, Finsbury Pavement, and Harlesden, N.W.:—

S. Yardley & Sons (accepted)	£200 0 0

LONDON.—For the erection of a school to provide accommodation for 1,200 children on the site in Sandford-row (East Lambeth Division), for the School Board for London. Mr. T. J. Bailey, architect:—

S. Belham & Co.	£21,199 6 6
J. Tyerman	20,953 0 0
G. Parker	20,879 0 0
J. Shillitoe & Son	20,290 0 0
D. Charteris	19,656 0 0
E. Lawrance & Sons	19,203 0 0
J. Longley & Co.	19,123 0 0
J. Marsland	18,848 0 0
W. Downs	18,423 0 0
C. Cox	18,156 0 0
Hart Bros.*	18,135 0 0

* Amended tender of £17,737 recommended by the Works Committee for acceptance.

LONDON:—For the erection of a school, to provide accomodation for 1,200 children, on the site in Plough-road (West Lambeth Division), for the School Board for London. Mr. T. J. Bailey, architect:—

S. Belham & Co.	£17,298 0 0
J. Holloway	16,600 0 0
J. Longley & Co.	16,211 0 0
J. Shillitoe & Son	15,980 0 0
D. Charteris	15,953 0 0
Hugh Knight	15,852 0 0
J. Marsland	15,709 0 0
E. Lawrance & Sons	15,691 0 0
W. Downs	15,357 0 0
Kirk & Randall	15,325 0 0
C. Cox*	14,970 0 0
Hart Bros.	14,938 0 0

*Amended tender of £14,575 recommended by the Works Committee for acceptance.

LONDON.—For the erection of a school to provide accommodation for 1,200 children on the site in Trinity-street (Finsbury Division), for the School Board for London. Mr. T. J. Bailey, architect:—

S. Belham & Co.	£16,159 6 6
Dove Bros.	16,011 0 0
W. Goodman	15,710 0 0
J. Longley & Co.	15,053 0 0
T. Boyce	14,906 0 0
D. Charteris	14,812 0 0
E. Lawrance & Sons	14,582 0 0
C. Cox*	13,977 0 0

* Amended tender, £13,655 recommended by the Works Committee for acceptance.

LONDON.—For erecting new premises for the Billingsgate Christian Mission. Mr. George Baines, architect, 4, Great Winchester-street, London, E.C. Quantities by Mr. J. R. Vining, Rolls-chambers, Chancery-lane:—

Higgs & Hill	£4,480 0 0
Brass & Sons	4,341 0 0
F. & H. F. Higgs	4,250 0 0
Colls & Sons	4,207 0 0
B. C. Nightingale	4,180 0 0
J. & J. Greenwood	4,077 0 0
James Morter	3,977 0 0
Mark Gentry	3,953 0 0
R. G. Battley, Clifton Works, 21, Old Kent-road, London, S.E.*	3,895 0 0

* Accepted.

LONDON.—For forming new millinery room at rear of 220, Upper-street, Islington, N., for Mr. T. R. Roberts. Mr. J. Kingwell Cole, architect, 28, Mount-street, Grosvenor-square, W.:—

F. Sage & Co.	£379 0 0
Drew & Cadman	246 0 0
S. Yardley & Sons (accepted)	243 0 0

LONDON.—For alterations to the "Hercules," Leadenhall-street, E.C., for Messrs. Rolls & Co. Mr. H. I. Newton, architect, 49, Victoria-street, Westminster, S.W.:—

T. Osborn, City	£1,489 0 0
C. F. Hewlitt, City	1,477 0 0
S. Godden, Bryanston-square	1,475 0 0
Philps & Bisiker, City	1,339 0 0
H. Burman & Son, Kennington-park	1,279 0 0
S. R. Lamble, Kentish Town	1,163 0 0
J. Beale, Westminster Bridge-road*	1,067 0 0

* Accepted.

LONDON.—For the erection of new shop, refreshment-buffet, &c., at rear of 217, Upper-street, Islington, N., for Mr. T. R. Roberts. Mr. J. Kingwell Cole, architect, 28, Mount-street, Grosvenor-square, W.:—

J. Grover & Son	£2,747 0 0
Dove Bros.	2,690 0 0
Williams & Son	2,626 0 0
G. H. & A. Bywaters	2,607 0 0
W. Scrivener & Co.	2,533 0 0
J. Smith & Son	2,375 0 0
Wall Bros. (accepted)	2,295 0 0

LONDON.—For decorative works to 35, Chepstow-villas, W., for Mr. H. Heaven. Mr. J. Kingwell Cole, architect, 28, Mount-street, Grosvenor-square, W.:—

Pope & Bray	£265 0 0
B. Colley	263 0 0
Traies & Son (accepted)	223 6 0
G. H. Carter	221 0 0

LONDON.—For building new factory and dwelling-house, William's-court, Sumner-street, Southwark, S.E., for Mr. Bibbey. Mr. John A. J. Woodward, architect, 10, Crown-villas, Kennington Oval:—

Greenwood	£824 0 0
Ford	742 0 0
Tyerman	726 0 0
Marsland	695 0 0
Hooper	649 10 0
J. Beale, Westminster Bridge-road	646 0 0

LONDON.—For new counter, cabinet, bar divisions, and lobby, enclosures, &c., for the "Bell and Anchor," Hammersmith, for Mr. H. Brown. Mr. Eugene C. Beaumont, architect, 43, Imperial-buildings, Ludgate-circus, E.C.:—

G. Coles	£1,087 0 0
G. Fuller	950 0 0
Collings & Co.	905 0 0
J. & H. Cocks	869 0 0
Turtle & Appleton	820 0 0
W. H. Lascelles	609 10 0
Drew & Cadman (accepted)	558 0 0

LONDON.—For repairs to be done to six houses, Nos. 46, 54, 56, 58, 60, and 62, Barnsbury-road, Islington, for Mr. J. Podzus. Mr. W. F. Potter, architect:—

H. Duffill, Stamford-hill	£270 0 0
E. T. Davy, King's-cross	200 0 0
J. Kingdon, St. Pancras	170 0 0
W. Wythe, Dalston	166 10 0
T. Hinton, Pentonville (accepted)	134 15 0

LONDON. — For alterations and decorations to No. 54, Portland-place, W., for Madame D'Agostino:—

S. Yardley & Sons (accepted)	£651 0 0

[No competition.]

LONDON. — For Moulmein teak-wood jewellers' interior fittings throughout, to No. 62, Piccadilly, W., for Mr. George Edward:—

S. Yardley & Sons (accepted)	£373 0 0

PLUMSTEAD.—For the erection of chapel, waiting-rooms, lodge, entrance-gates, workmen's rooms, and other buildings, in Wickham-lane, for the Plumstead Burial Board. Mr. H. H. Church, architect, Woolwich:—

Marriott	£5,923 0 0
Chapman	5,189 0 0
Holloway	4,878 0 0
Staines & Son	4,825 0 0
Battley	4,593 0 0
Longley & Co.	4,550 0 0
Richardson	4,239 0 0
Kemp	4,098 0 0
Proctor (accepted)	4,000 0 0
Martin	3,998 0 0

PLYMOUTH.—For the erection of the Plymouth Science, Art, and Technical Schools. Mr. A. D. Shortridge, architect, 14, Old Town-street, Plymouth. Quantities supplied:—

J. Reed	£5,786 0 0
T. May	5,783 0 0
Pethick Bros.	5,761 0 0
Tozer & Son	5,554 0 0
P. Blowey	5,500 0 0
G. Shillabear	5,476 0 0
Palk & Partridge	5,472 0 0
J. Finch	5,440 0 0
W. Trevena	5,390 0 0
Lapthorne & Goad	5,351 0 0
R. & C. Rowse	5,165 0 0
A. R. Lethbridge & Son	5,134 0 0
T. Kennedy	5,105 0 0
S. Roberts	5,015 0 0
A. R. Debnam	4,972 0 0

[All of Plymouth.]

SALISBURY.—For additions to Wick House, Downton, for Mr. Silas J. Taunton. Messrs. Nevinson & Newton, architects, 7, Staple-inn, London, W.C.:—

J. Bailey, Downton (accepted)	£2,100 0 0

SHERE (Surrey).—For additions to the Surrey Trading Company's Premises, Shere, Surrey. Mr. Geo. Baines, architect, 4, Great Winchester-street, London, E.C.:—

J. S. Brown, Guildford	£680 0 0
A. Parsons, Shere (accepted)	558 0 0
A. A. Cumpey, Gomshall, near Guildford	550 0 0

[Architect's estimate, £547.]

SMETHWICK (Birmingham).—For the erection of entrance-lodge and out-buildings, at the Uplands Cemetery, for the Smethwick Local Board. Messrs. Harris, Martin, & Harris, architects:—

G. Trentham, 14, Broad-street-corner, Birmingham (accepted)	£553 0 0

STRATFORD. — For new show-rooms, Broadway, Stratford, E., for Messrs. C. Boardman & Sons. Mr. Geo. Baines, architect, 4, Great Winchester-street, E.C.:—

F. & H. F. Higgs	£2,990 0 0
H. H. Hollingsworth	2,935 0 0
Mark Gentry	2,850 0 0
J. Godfrey & Son	2,645 0 0
S. J. Scott	2,597 0 0
R. G. Battley	2,597 0 0
F. J. Coxhead, Leytonstone*	2,544 12 0

*Accepted.

Show-room Fittings.

Drew & Cadman	£377 0 0
Sage & Co.	357 0 0
T. Drake, 72, Great Percy-street*	320 2 0

*Accepted.

STRATFORD.—For erecting new library and kitchen and offices, Magnolia House, the Green, Stratford, E., for Mr. C. Boardman. Mr. Geo. Baines, architect, 4, Great Winchester-street, E.C.:—

R. G. Battley	£549 0 0
S. J. Scott	489 0 0
F. J. Coxhead (accepted)	400 0 0

[Architect's estimate, £416.]

TAUNTON.—For the erection of new vicarage-house, Holy Trinity. Mr. George C. Strawbridge, architect, Taunton:—

Templeman	£2,900 0 0
Pollard	2,688 0 0
A. J. Spiller	2,590 0 0
H. J. Spiller	2,580 0 0
Morse	2,494 0 0
Jones	2,355 0 0

TAUNTON.—For the erection of a lawn tennis pavilion, for the Lawn Tennis Club Committee. Mr. George C. Strawbridge, architect:—

A. J. Spiller	£197 0 0
Morse	189 0 0
Fox	175 0 0
Handford	175 0 0
Jones	165 0 0
H. J. Spiller	158 0 0
Rendell & Sons	154 0 0

TOOTING (Surrey).—For alterations and additions to "The Prince of Wales," Garrett-lane, Tooting. Mr. H. I. Newton, architect, 49, Victoria-street, Westminster, S.W.:—

J. Walker, Poplar	£373 0 0
H. Burman & Sons, Kennington-park	365 0 0
S. Godden, Bryanston-square	359 0 0
S. R. Lamble, Kentish Town	351 0 0
Isles, Battersea	347 0 0
Smith, Son, & Fletcher, Belgravia*	340 0 0

*Accepted.

WOODFORD.—For erection of pair of villa residences, Woodford, Essex, for Mr. J. R. Roberts. Mr. J. Kingwell Cole, architect, 28, Mount-street, Grosvenor-square, W.:—

Wall Bros. (accepted)	£2,000 0 0

WOOLWICH.—For iron van-shed on the Dockyard Wharf, for Messrs. C. & C. Tuff. Mr. H. H. Church, architect, Woolwich:—

Humphreys	£198 0 0
Morton	179 10 0
Martin	158 0 0
Main & Co. (accepted)	131 0 0

WOOLWICH.—For alterations and additions to the "Royal Oak" public-house, New-road, Woolwich. Mr. H. H. Church, architect, Woolwich:—

A. J. Fenn (accepted)	£184 0 0

WOOLWICH.—For alterations and repairs after fire at No. 49, Artillery-place. Mr. H. H. Church, architect, Woolwich:—

E. G. Covil (accepted)	£150 0 0

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Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, and for the front Page by the same hour on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY mornings.

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GREENHOUSES,
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TO CORRESPONDENTS.

F. D. B.—T. & T.—C. T. R.—W. H. R.—G. C. S.—J. & C. M. (thanks: we will make inquiry).—J. R.—W. Y. B. (your contributions are perfectly worthless, and it is useless your persisting in sending them. In future no notice can be taken of them).—G. T. H.—R. C. (illegible).—W. W. P.—J. J. S.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

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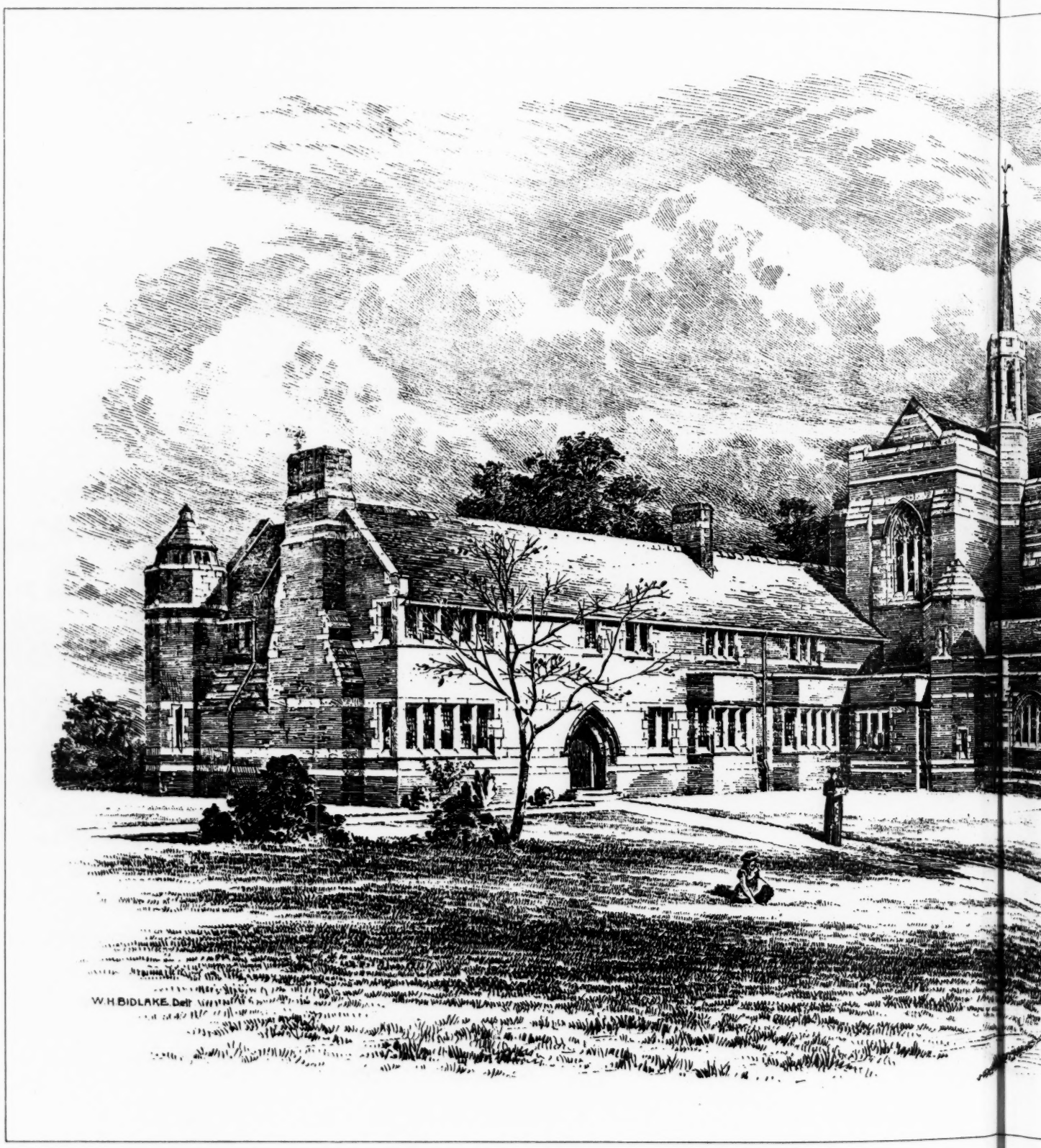

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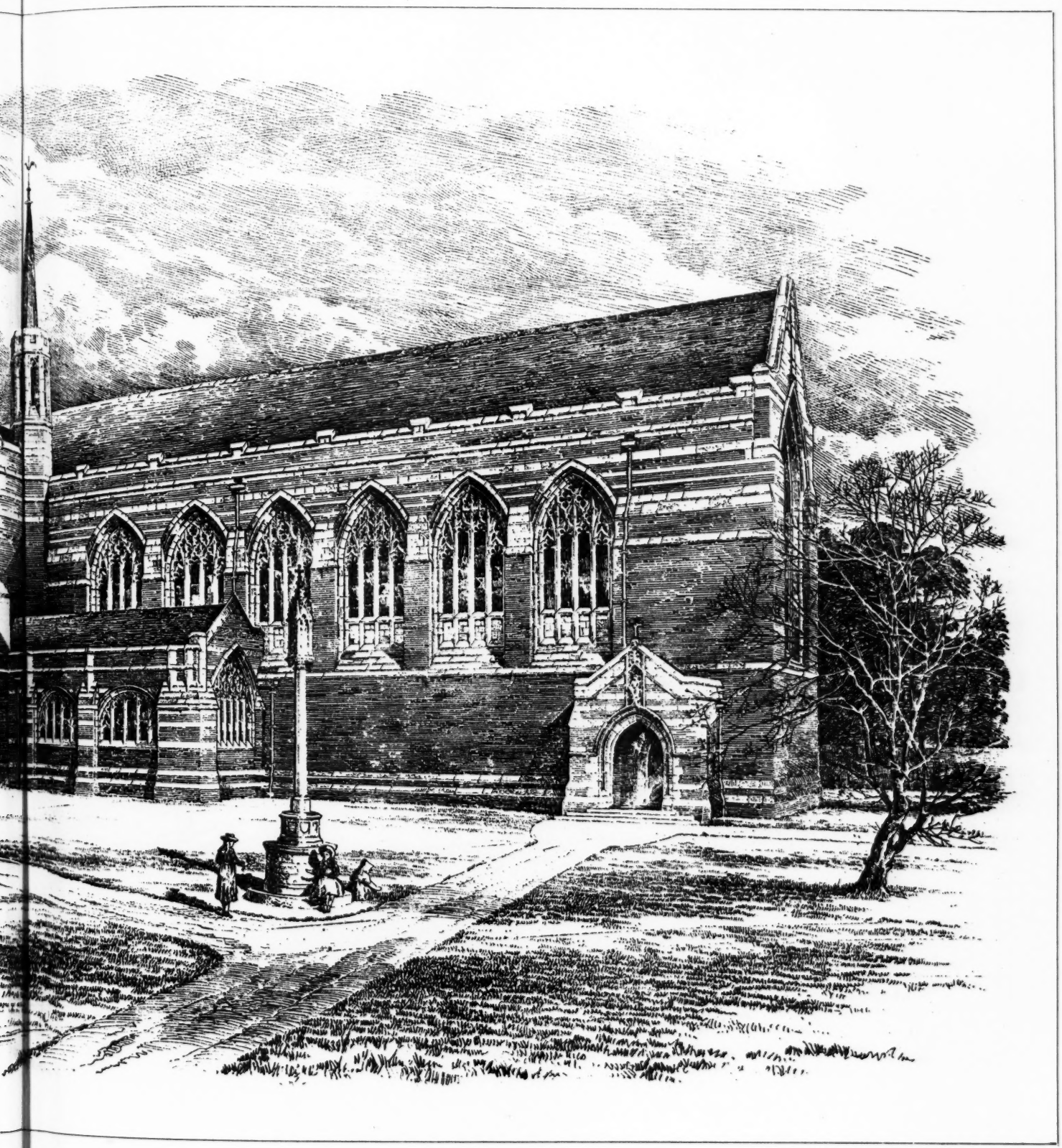

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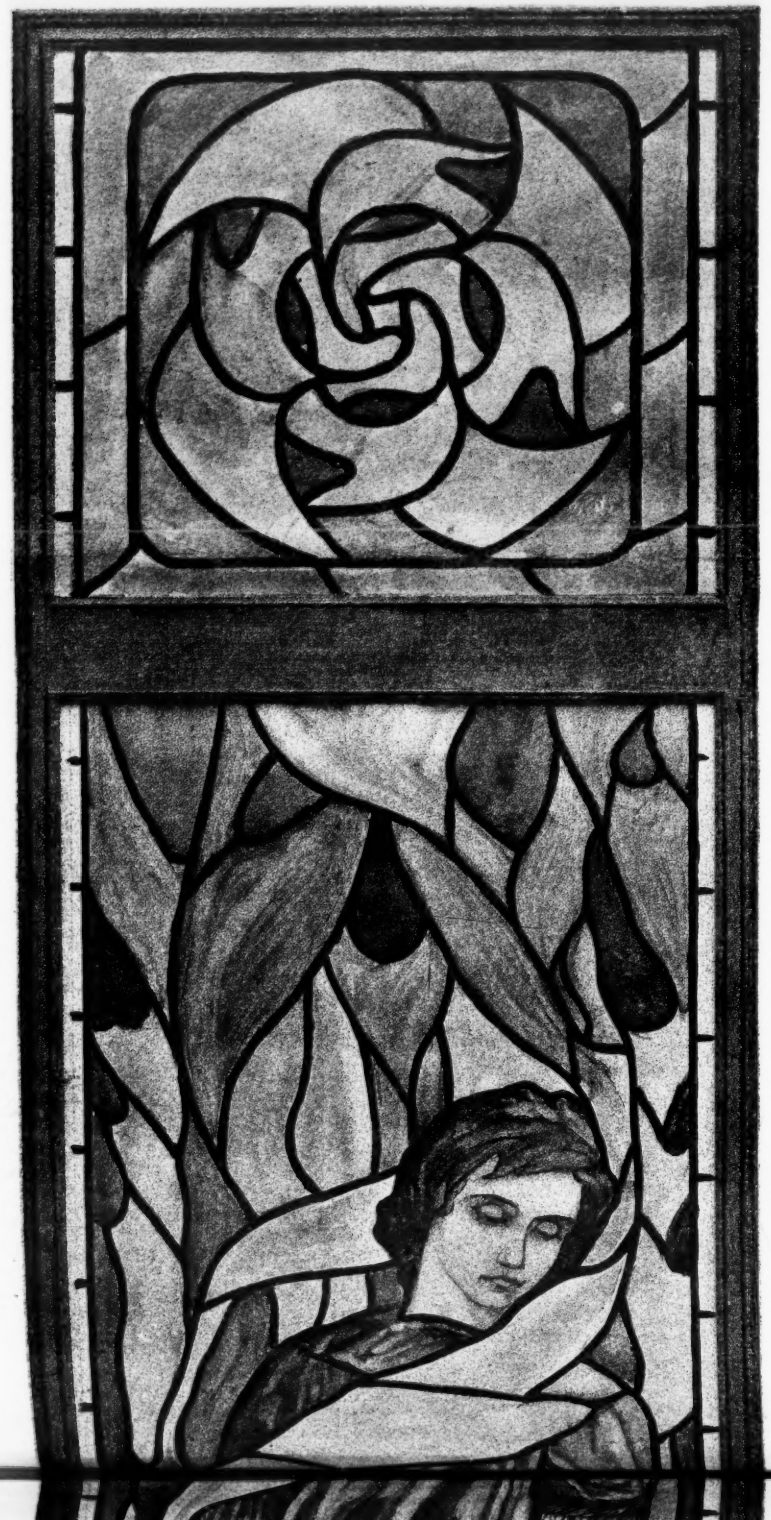

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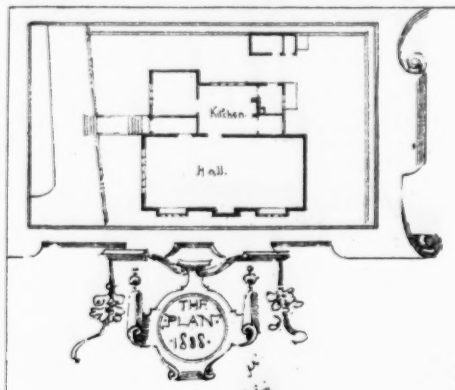

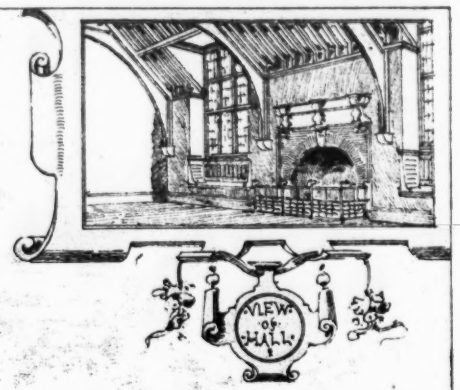

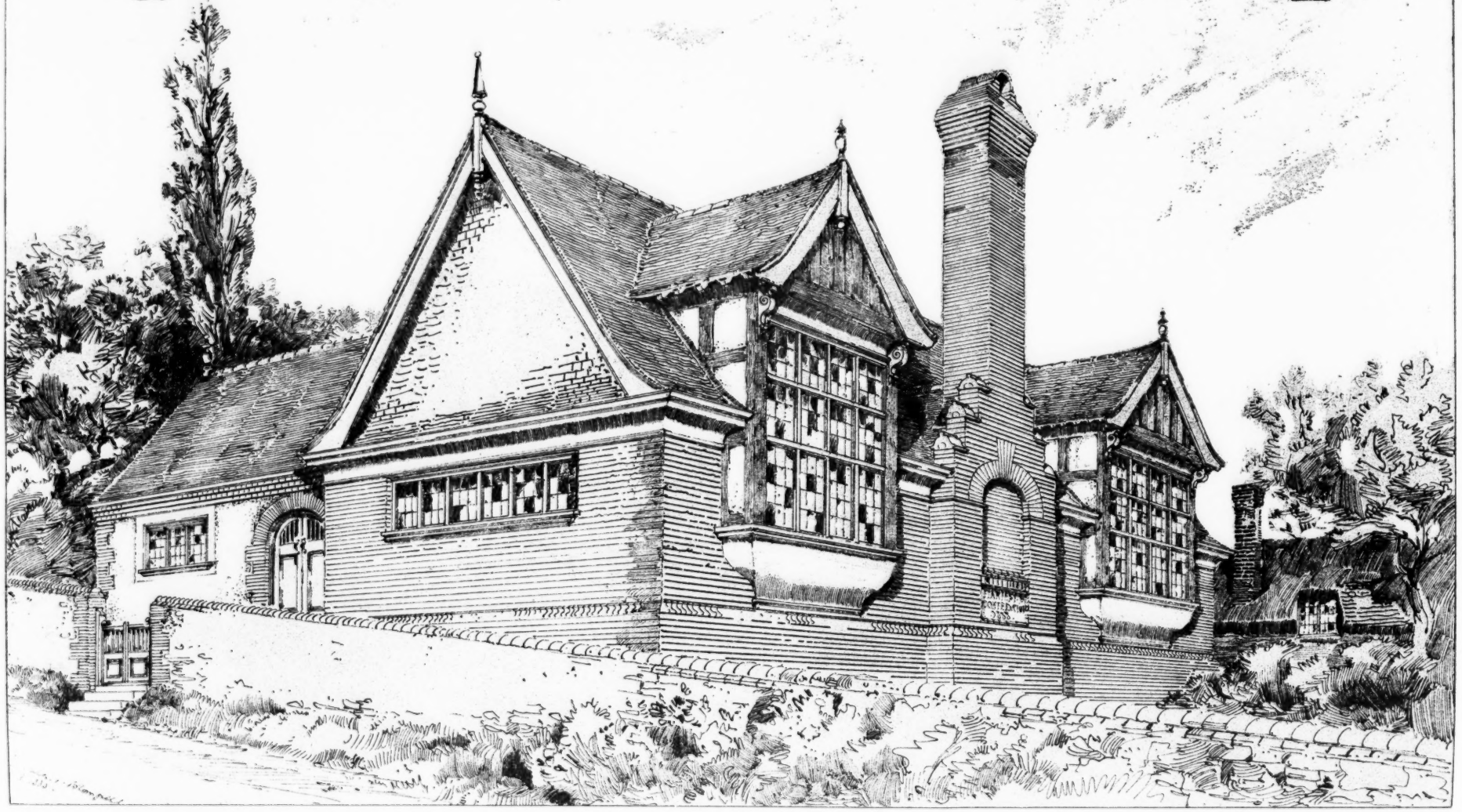

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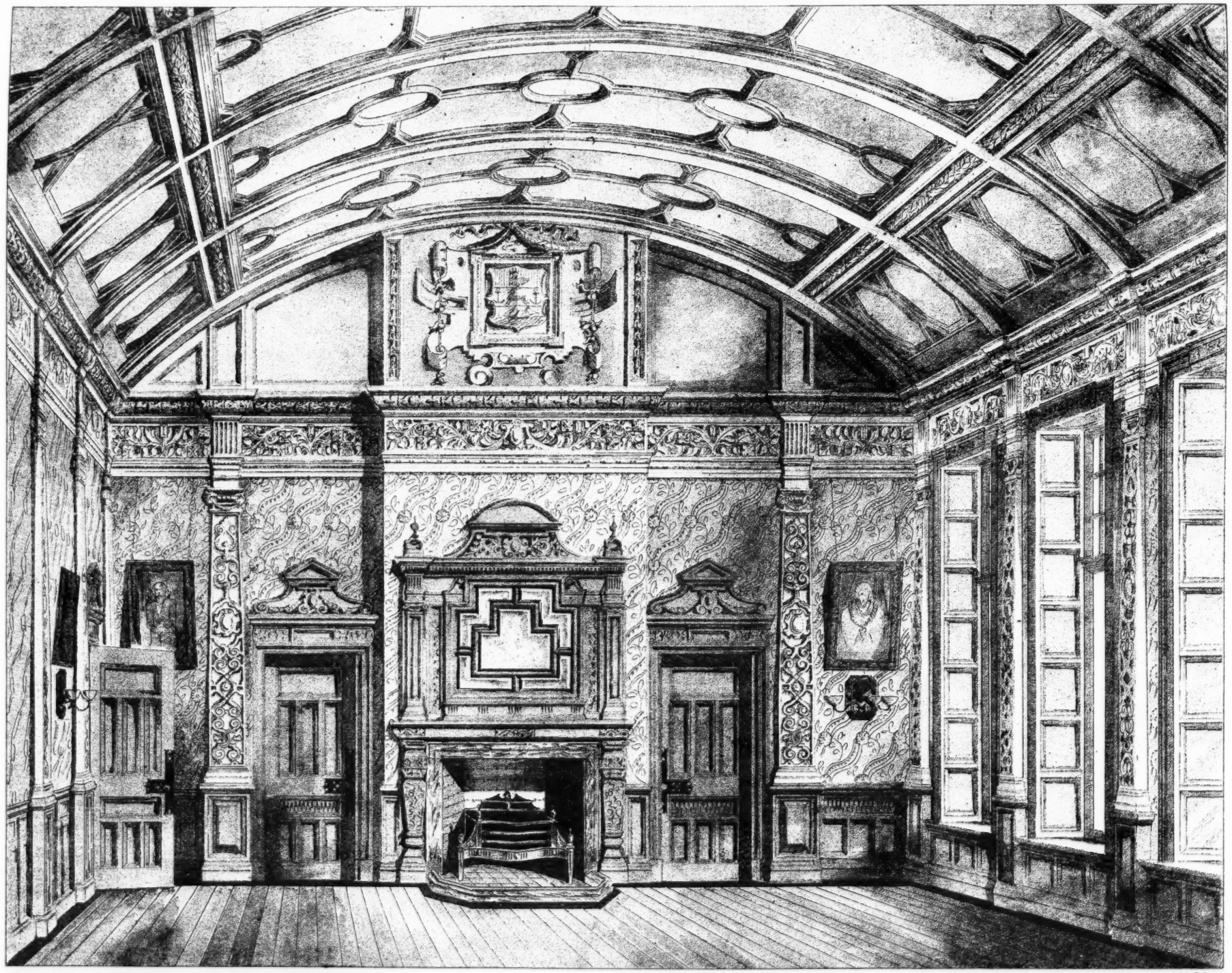

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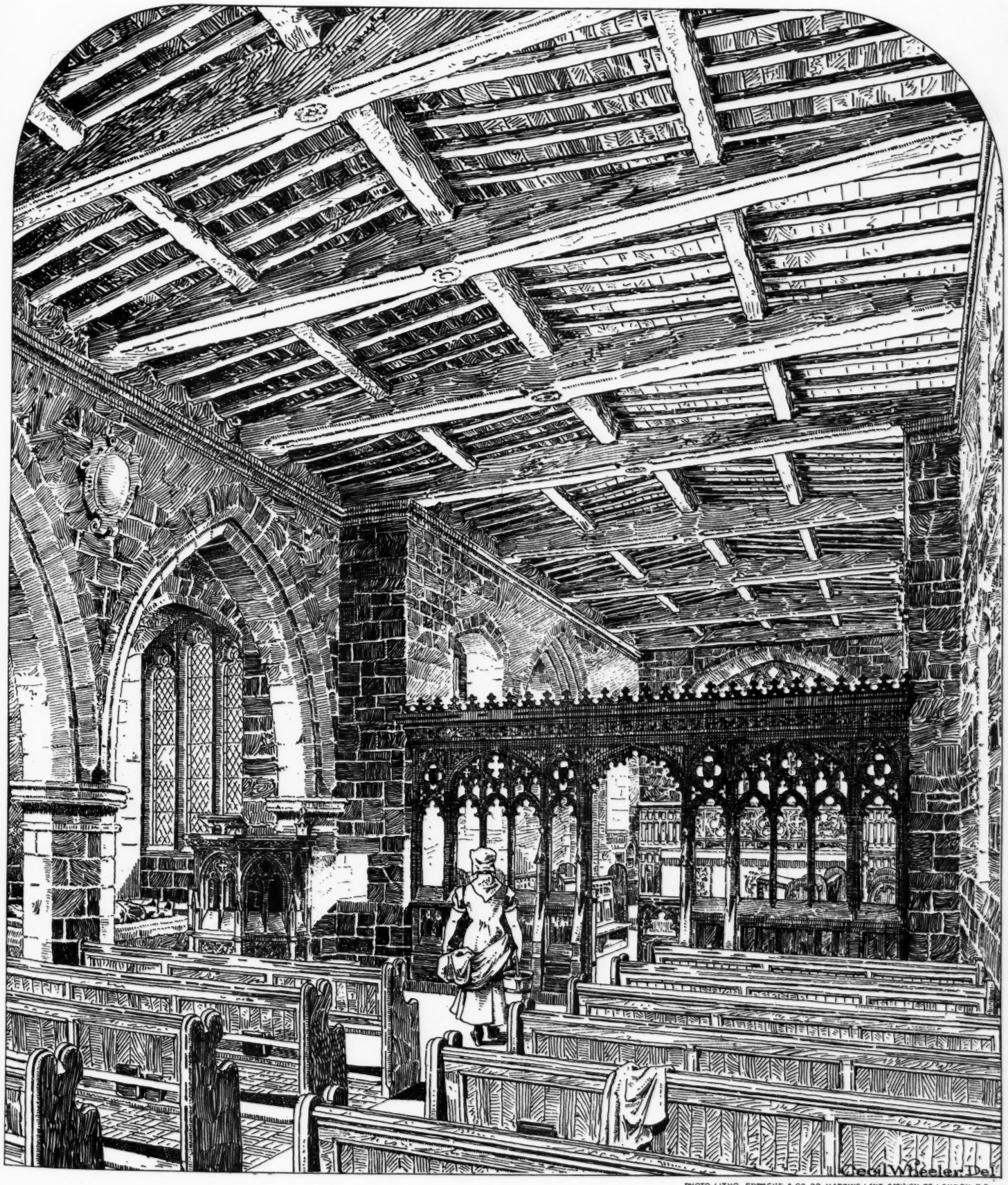

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